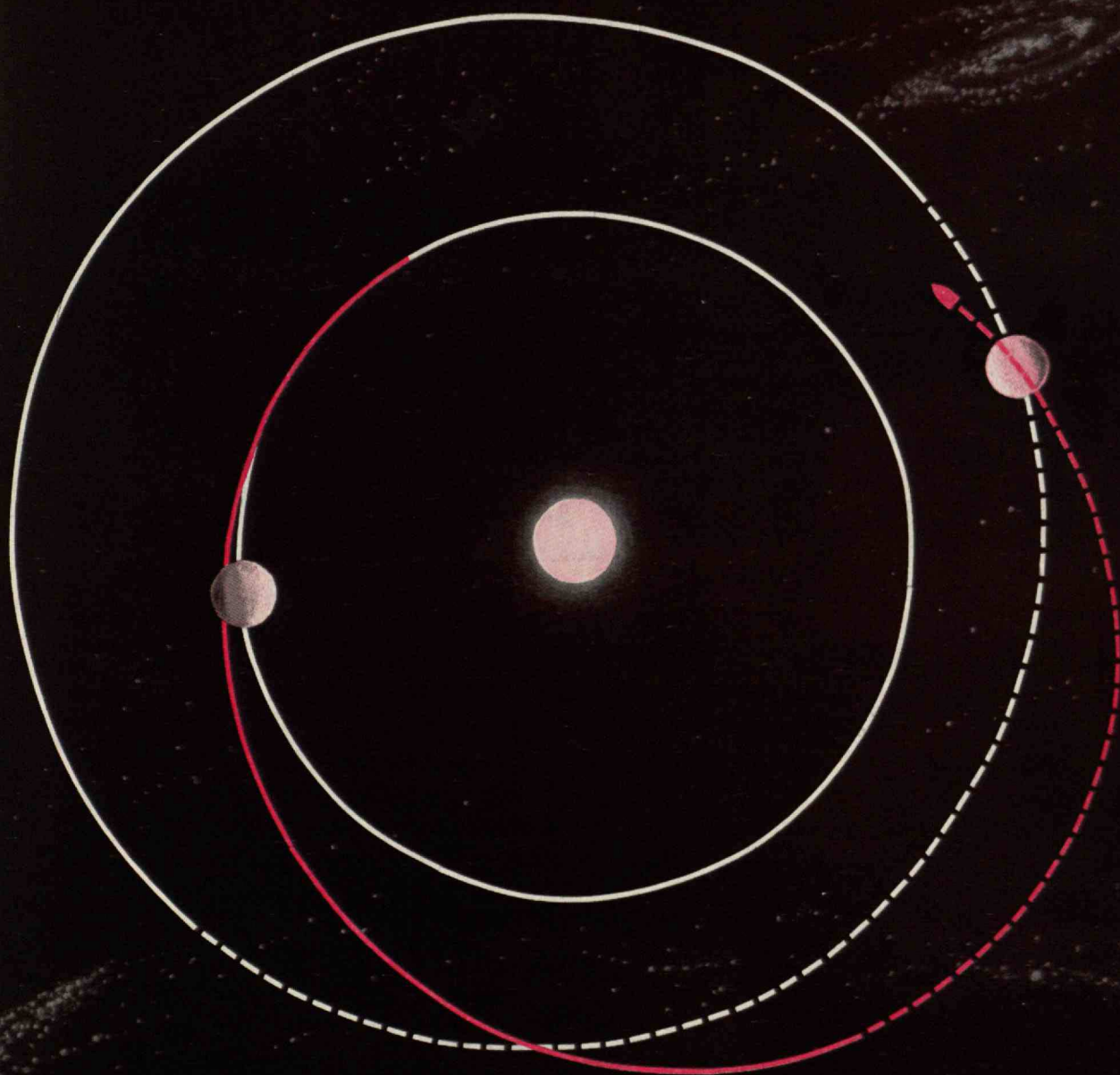


TECHNOLOGY

REVIEW

March 1959



technology review

Published by MIT

This PDF is for your personal, non-commercial use only.
Distribution and use of this material are governed by copyright law.
For non-personal use, or to order multiple copies please email
permissions@technologyreview.com.



wherever there's electronics...

there's Transitron

Atomic subs can navigate the globe without surfacing — getting their bearings from electronic inertial guidance systems. Vital to the reliability of these guidance systems is the tiny semiconductor. The industry's broadest line of advanced silicon and germanium semiconductors is made by Transitron, whose 3000 skilled employees specialize exclusively in these products. In atomic subs, communications, missiles, industrial computers, radar, jets — *wherever there's electronics* — there's Transitron, known the world over for leadership in semiconductors.

TRANSISTORS • RECTIFIERS • DIODES • REGULATORS • VOLTAGE REFERENCES

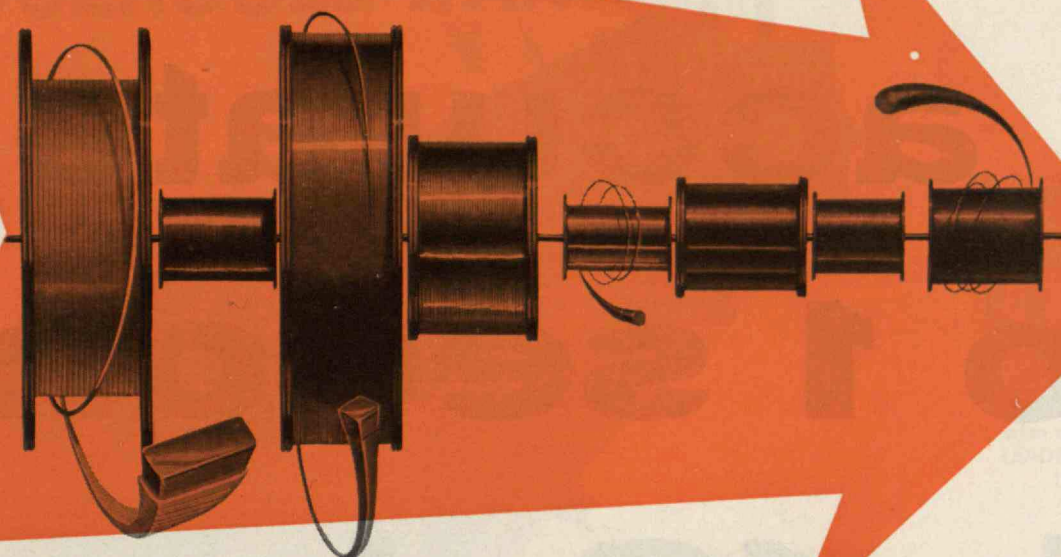


Transitron

electronic corporation • wakefield, massachusetts



SALES OFFICES IN PRINCIPAL CITIES THROUGHOUT THE U. S. A. • CABLE ADDRESS: TRELCO



Magnet Wires that pace the Industry come from Phelps Dodge!

Phelps Dodge Applied Research has developed many outstanding magnet wires that are designed to anticipate the requirements for advanced insulation system designs. This widely diversified group of Phelps Dodge "firsts" includes:

CLASS A (105°C)

SODEREZE® (solderable); **FORMVAR** (square and rectangular)
BONDEZE® (self-bonding); **S-Y BONDEZE®** (solderable self-bonding)
GRIP-EZE (solderable self-gripping)

CLASS B (130°C)

NYLEZE® (solderable); **THERMALEZE® B** (round film)

CLASS F (155°C)

THERMALEZE® F (round, square and rectangular film)
DAGLAS® (flexible glass)

CLASS H

DAGLAS® H (flexible glass)

Any time magnet wire is your problem, consult Phelps Dodge for the quickest, surest answer!

**FIRST FOR
LASTING QUALITY
—FROM MINE
TO MARKET!**



**PHELPS DODGE COPPER PRODUCTS
CORPORATION**

INCA MANUFACTURING DIVISION

FORT WAYNE, INDIANA

THE TECHNOLOGY REVIEW, March, 1959, Vol. LXI, No. 5. Published monthly from November to July inclusive at Emmett Street, Bristol, Conn. Publication date: twenty-seventh of the month preceding date of issue. Annual subscription, \$4.00; Canadian and Foreign subscription, \$4.50. Entered as second-class matter December 23, 1949, at the Post Office, at Bristol, Conn., under the Act of March 3, 1879.

THE TIME INDICATOR UNIT

accurate to 1 second in 12 days



TIMES MODEL TS-3 CHRONOMETER

Program timer, pulse generator and clock. Timing assemblies, driven by the clock motor, provide momentary contact closings at rate of

• **ONCE A SECOND • ONCE A MINUTE • ONCE AN HOUR**

also optional frequency or pulse outputs as specified in range between 10 and 1000 cps.

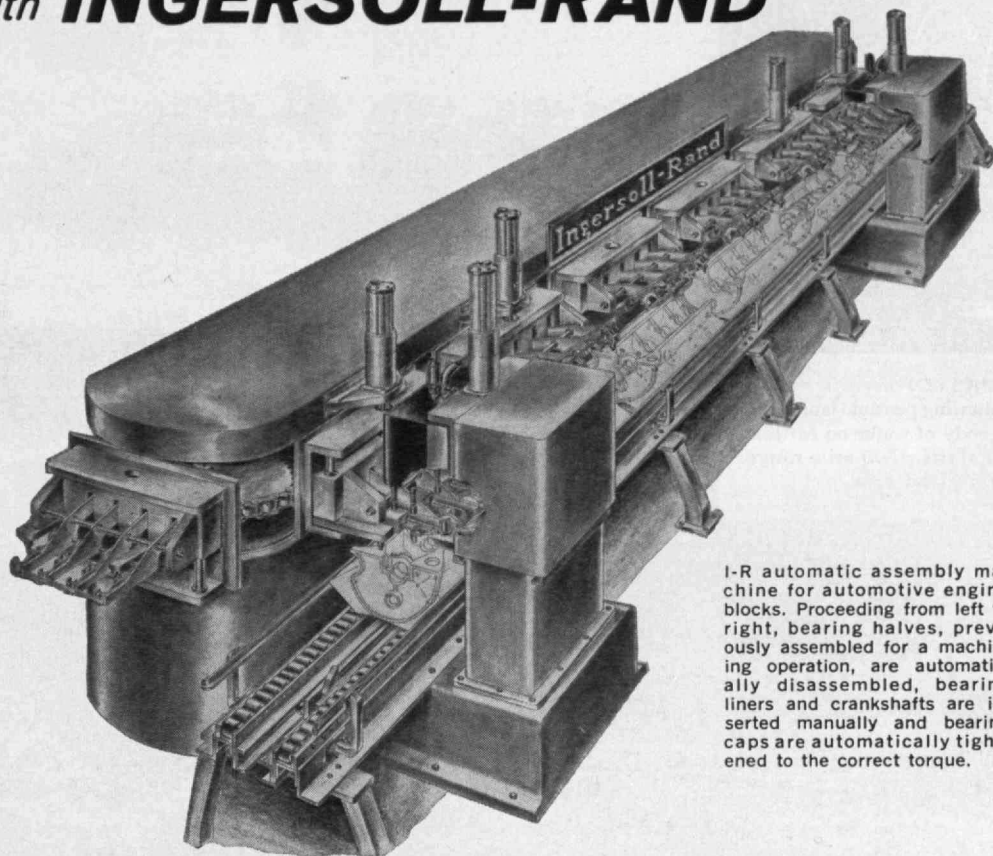
PRICE: \$950.00, F.O.B. Factory.

Optional frequency output, \$50.00 each.

Write for details.

TIMES FACSIMILE CORPORATION
540 West 58th Street, New York 19, N. Y.

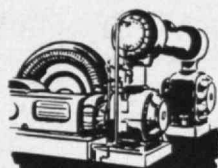
A. G. Cooley
Class of '24 VI

with **INGERSOLL-RAND**

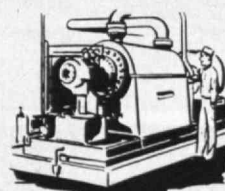
I-R automatic assembly machine for automotive engine blocks. Proceeding from left to right, bearing halves, previously assembled for a machining operation, are automatically disassembled, bearing liners and crankshafts are inserted manually and bearing caps are automatically tightened to the correct torque.



also means
LEADERSHIP
in



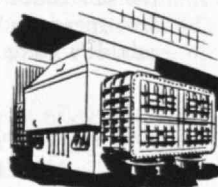
Compressors and Blowers



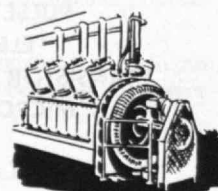
Centrifugal Pumps



Rock Drills



Steam Condensers



Diesel & Gas Engines

If you are interested in automation...

Here's what Air-Tool Engineering at Ingersoll-Rand can mean to you

AUTOMATION, today, is the magic word that is opening new horizons for cost-saving economy in practically every industry. Things that used to be done by hand are now being done automatically. Here is a rapidly growing field which offers fine opportunities for you as a mechanically minded engineer.

Many interesting engineering problems arise in the design, development and experimental work on such machinery, and creative engineering is necessary to solve them. Practical engineering ability is also needed for installation and initial operation of such equipment. The early studies of customers' needs and automation equipment sales are also challenging jobs.

Ingersoll-Rand is a recognized leader in designing and building these labor-saving air and electric tools, and is also one of the

country's leading manufacturers of air compressors, pumps, rock drills, gas and diesel engines, vacuum equipment. All of these products depend heavily on advanced engineering in their design, manufacture and field application.

Then there are the advantages of living in Athens, Pa., where Ingersoll-Rand builds automation equipment. The picturesque Pennsylvania hills provide many recreational advantages that are particularly appealing to the outdoor man.

If you are looking for a leadership career with long-range job security and excellent opportunities for advancement, you'll find it at Ingersoll-Rand.

For further details, contact your Placement Office, or write to Ingersoll-Rand, 11 Broadway, New York 4.

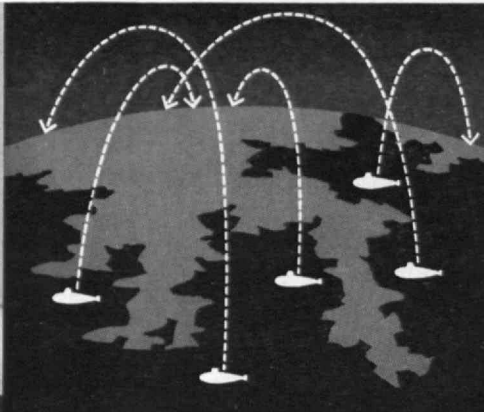
OPPORTUNITIES FOR ENGINEERS NOW AVAILABLE:

- Sales Engineering
- Production Engineering
- Design Engineering
- Business Engineering

Ingersoll-Rand

8-733 11 Broadway, New York 4, N. Y.

*Among the many graduates of Massachusetts Institute of Technology at Ingersoll Rand are:
L. C. Hopton, 1926, First Vice-President and Secretary; P. J. Bentley, 1925, Vice-President.*



STRATEGIC IMPORTANCE of Polaris is seen in this symbolic map showing possible launching sites. Every major body of water on earth is potential site for Polaris. 1500-mile range covers most of world's land area.



CAREER ENGINEERS

Another example of diversified work available to engineers at SPERRY

Sperry offers you the kind of work engineers thrive on — big assignments, interesting, important, diversified. Assignments connected with world-famous projects like the Polaris Missile. Launching a missile at a distant target from a maneuvering atomic sub presents extraordinary navigation problems. Location of the sub must be known precisely. To provide exact navigation data, Sperry is developing for the Navy advanced electronic and gyroscopic systems that will stabilize the sub, continuously establish its precise position and true speed, and feed target data automatically into the missile's guidance system.

That's the kind of assignment you will get, at Sperry. The kind of assignment that puts you side-by-side with some of America's foremost engineers. The kind of assignment that not only offers you a good job now, but also exceptional opportunity for advancement. Sperry engineers are career engineers. They grow with the firm — and Sperry has a remarkable record of almost a half century of continuous growth! No wonder most of our top men are engineers who have worked their way up. Our present production and future potential are both at record levels. Check Sperry — now!

If you're interested in an engineering career, CHECK SPERRY

Stimulating Professional Opportunities Exist in Many Fields Including:

INERTIAL NAVIGATION SYSTEMS
DOPPLER NAVIGATION • RADAR RECEIVERS
RADAR TRANSMITTERS • INFRARED SYSTEMS
PULSE CIRCUITS • GYROSCOPICS
ELECTRONIC PACKAGING
TRANSISTOR CIRCUITS *For Pulse & Video Applications*
MICROWAVE ANTENNA DESIGN

*Confidential
Interviews*

Contact
Mr. J. W. Dwyer
Employment Manager

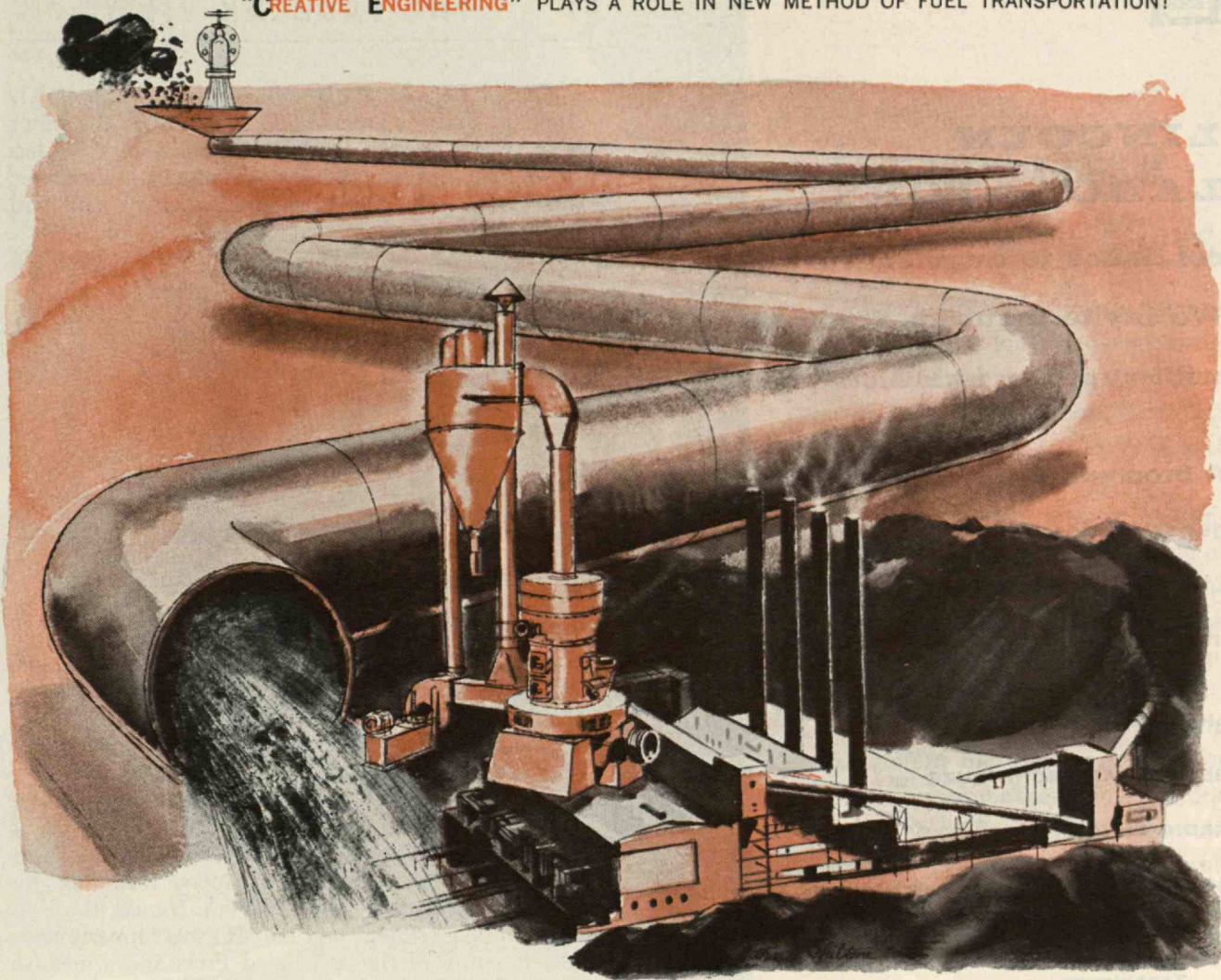
*Saturday
Interviews*

8 A.M. To 1 P.M.
Arranged by
Appointment

SPERRY *GYROSCOPE COMPANY*
 Division of Sperry Rand Corp.

GREAT NECK, LONG ISLAND, N. Y.
Fieldstone 7-3665

"CREATIVE ENGINEERING" PLAYS A ROLE IN NEW METHOD OF FUEL TRANSPORTATION!



History-making pipeline effects new economies in fuel transportation

The first long-distance coal pipeline in the United States went into regular commercial operation last summer and is now moving coal . . . at a rate of more than 1.25 million tons a year . . . from a mine to a utility power station over a hundred miles away. This history-making pipeline runs from the Georgetown properties of Consolidation Coal Company in eastern Ohio to the Eastlake plant of The Cleveland Electric Illuminating Company near Cleveland. The coal is pumped in the form of a "slurry"—a 50-50 mixture of crushed coal and water.

At the Eastlake plant, the slurry is delivered to dehydrating equipment—including a battery of C-E Flash Drying Systems. Moisture is removed at the rate of 36,000 gallons per hour. The dried coal is then pulverized in C-E Raymond Pulverizers and burned in four mammoth C-E Boilers of the Controlled Circulation type . . . together capable of producing over 4,000,000 pounds of steam per hour.

Once again, C-E equipment plays an important part in an industry's technology—helping to bring new economy to power generation.

"CREATIVE ENGINEERING" is the reason for the leadership attained by C-E products. The products which bear this mark of leadership include:

all types of steam generating, fuel burning and related equipment • nuclear power systems • paper mill equipment • pulverizers • flash drying systems • pressure vessels • soil pipe

COMBUSTION ENGINEERING

Combustion Engineering Building, 200 Madison Avenue, New York 16, N. Y.



C-197



LINCOLN LABORATORY

continues to augment its staff.

We invite inquiries from persons
with superior qualifications.

A brochure is available which is
generally descriptive of

Lincoln Laboratory programs

in the following areas:

AICBM SYSTEMS STUDIES

NEW RADAR TECHNIQUES

RADIO PHYSICS

SOLID STATE Physics, Chemistry, and Metallurgy

COMMUNICATIONS:

Techniques

Psychology

Theory

**INFORMATION PROCESSING,
DIGITAL COMPUTER TECHNOLOGY**

Research and Development

**M.I.T. LINCOLN
LABORATORY**

BOX 28

LEXINGTON 73, MASSACHUSETTS



THE TABULAR VIEW

"As of February 1."—With the last issue of The Review, BEVERLY DUDLEY, '35, relinquished the editorship, which post he has graced so admirably since 1945, to accept appointment as Assistant to the Director of the Institute's Lincoln Laboratory; and with



M.I.T. Photos

B. Dudley, '35



Volta Torrey

this current issue VOLTA W. TORREY, since 1956 Director of Television at M.I.T., makes his bow and blush as The Review's 10th Editor. Technically, the transmission of portfolios in each instance occurred as of midnight, January 31.

A native of Eddyville, Iowa, Mr. Torrey is a graduate of the University of Nebraska's Class of 1926 who later attended the University of Chicago and was a Nieman Fellow at Harvard University. He has been associated with several newspapers, including the *Chicago Tribune*, the *Omaha World-Herald*, the *New York Herald Tribune*, and *PM*. He was formerly news review editor of the Associated Press and a member of the staff of *Popular Science Monthly* for 12 years, five as that magazine's editor. He is a former president of the National Association of Science Writers, and served on the United States Strategic Bombing Survey in 1945.

Mr. Torrey will continue to appear from time to time on "The Science Reporter" program presented by M.I.T. on station WGBH-TV, a program for which he has been host since 1956 when he joined the staff of the Institute's Office of Public Relations to take charge of its television and radio activities.

Coincident with the change in the editorship of The Review, FREDERICK G. LEHMANN, '51, has been appointed As-



F. G. Lehmann, '51

sistant Secretary of the Alumni Association by its Executive Committee. As an undergraduate, Mr. Lehmann was active in student government, holding official posts therein during his junior and senior years. During 1951-1953, he served as 1st Lieutenant with the U.S. Air Force; during 1953-1954, he was a staff

(Concluded on page 228)

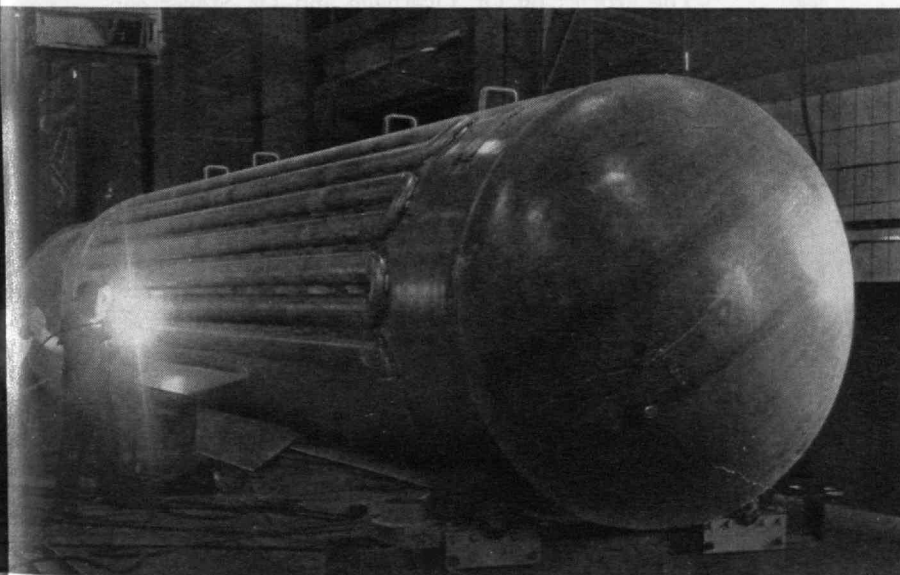


Another Example of Skill With Alloys

Graver's skill with alloys is demonstrated by a long and successful record of fabricating aluminum tank cars for the Union Tank Car Company, North America's largest tank car fleet owner.

Aluminum isn't always the easiest metal to weld. In fact, some of the aluminum alloys are downright pesky at times. But never so much so that Graver can't handle them competently.

Forming, fitting and welding aluminum for tank cars, and for any number of other things, is done with the craftsmanship you would expect from a company with Graver's 100 years of experience in metal fabrication.



GRAVER TANK & MFG. CO.

DIVISION—UNION TANK CAR COMPANY

EAST CHICAGO, IND.

Plants and Offices Across America

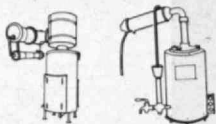
GRAVER®

Barnstead

pure
water
specialists
since
1878...

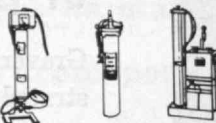
STILLS

In capacities of from 1/2 to 1000 g.p.h., for laboratory, commercial and industrial use.



DEMINERALIZERS

Mixed-Bed, One-Bed, Two-Bed, and Four-Bed models. Capacities up to 2500 g.p.h.



TRANSISTOR WASHERS



For washing and rinsing transistors, diodes, rectifiers, tube parts, and materials such as Silicon and Germanium.

ULTRA PURE WATER

BARNSTEAD® "MF"® Sub-micron Filter for electronic and nuclear fields. Filters out particles to .000016 inches. Produces 18,000,000 ohm water.



Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

THE TABULAR VIEW

(Concluded from page 226)

member of the Lincoln Laboratory; and since 1954, he has been associated with the Procter and Gamble Manufacturing Company.

In joining the resident staff of the Alumni Association in Cambridge, Mr. Lehmann relinquishes his office as President of the M.I.T. Club of Kansas City.

H. E. LOBDELL, '17

The Theme Is Space.—As the cover of this issue suggests, the emphasis this month is on the penetration of hitherto inaccessible parts of the solar system. The trajectory to Mars shown on the cover is explained on page 232. Two of the major articles which follow deal with the space age. Defense research in such an age is described by CARL F. J. OVERHAGE (page 239), and the engineering problems of space flight are outlined by H. GUYFORD STEVER (page 244).

Dr. Overhage became director of Lincoln Laboratory two years ago. Born in London, he studied physics at the California Institute of Technology, came to M.I.T. to lead a research group in the Radiation Laboratory, and later became assistant director of the color technology division of the Eastman Kodak Company. He has been active in defense research for many years, and worked in Europe in 1954 on problems related to NATO.

Dr. Stever is professor of aeronautics and astronautics and associate dean of the School of Engineering. He was formerly chief scientist of the Air Force and is now chairman of the Research Advisory Committee on Missile and Spacecraft Aerodynamics of the National Aeronautics and Space Administration. His wide knowledge has brought him a deluge of requests for lectures and interviews.

The articles by Dr. Overhage and Dr. Stever contain the essence of their talks this winter at the Alumni Regional Conference in Detroit, which is described in the Trend of Affairs section (page 237).

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

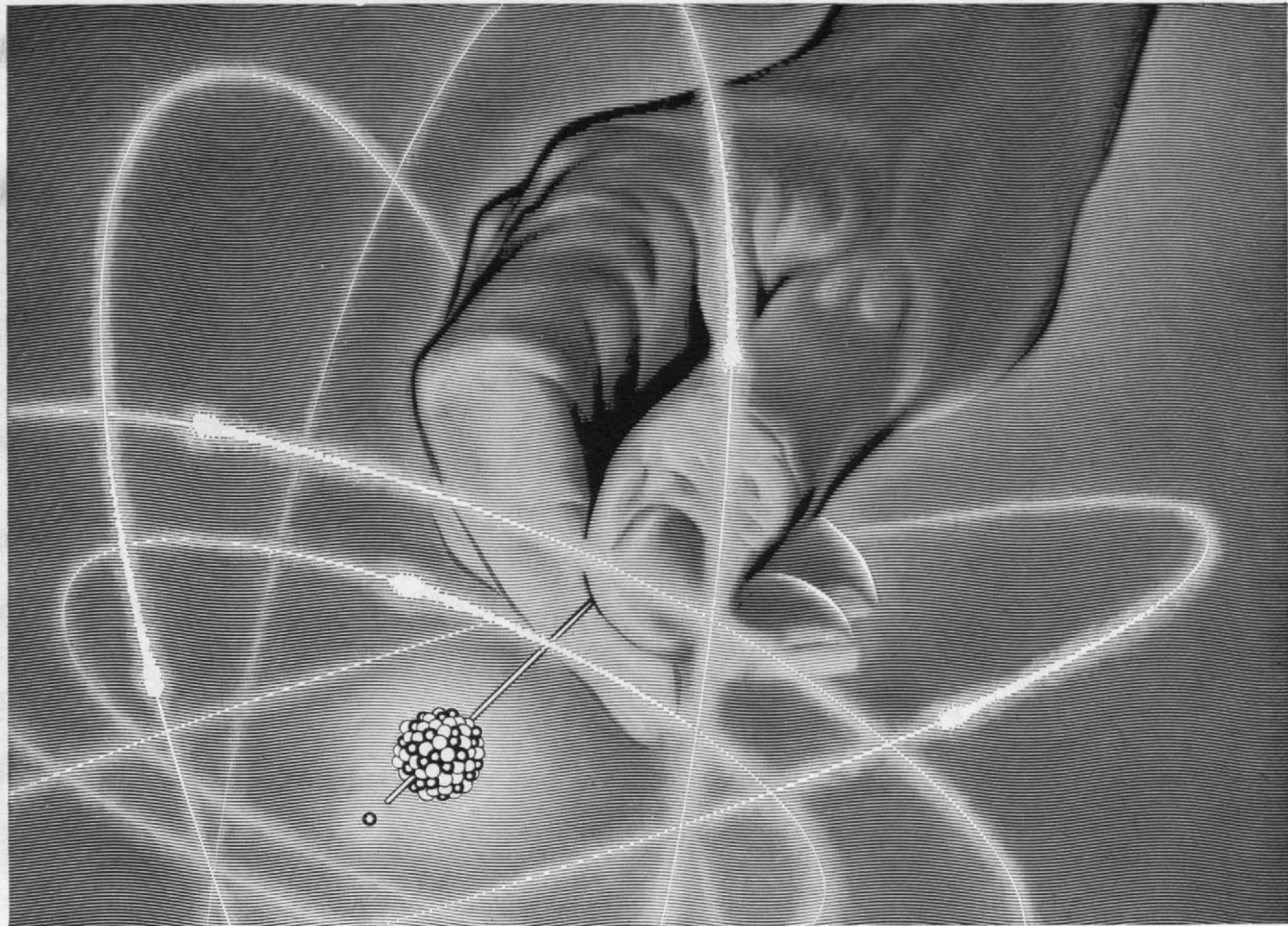
Barnstead

STILL & STERILIZER CO.

A. White, '26 T. Hartwell, '28
N. A. Everett, '48 V. C. Smith, '48 S. Beran, '58
2 Lanesville Terrace, Boston 31, Mass.

Barnstead

STILL & STER



... a hand in things to come

Probing the atom...for you

The boundless energy of the uranium atom means a brighter future

Every day brings the benefits of atomic energy closer to our daily living. It presents a whole new field of exploration for scientists all over the world.

A longer, healthier life is hopefully ahead as radiation is helping doctors learn more about the basic processes of life by revealing how certain elements are put to work by the body. The controlled rays of the atom are also being used to pin-point malignant tissues for subsequent treatment. And radiation studies of how plants absorb nutrition from sun and soil are showing the way to improved food supplies.

These are but a few of the vital jobs being done by radioisotopes—radioactive materials created in atomic reactors at Oak Ridge, Tennessee... the great atomic energy center operated by Union Carbide for the U. S. Atomic Energy Commission. The people of Union Carbide will continue their pioneering research in atomic energy—and in the vital fields of alloys, carbons, chemicals, gases and plastics—to bring you a brighter future.

Learn more about the exciting work now going on in atomic energy. Send for the illustrated booklet, "The Atom in Our Hands." Union Carbide Corporation, 30 East 42nd Street, New York 17, N.Y. In Canada, Union Carbide Canada Limited, Toronto.

**UNION
CARBIDE**

...a hand
in things to come

Now...to meet the challenge of today's new kind of driving...Goodyear presents:

The World's First Turnpike-Proved Tires!



Pennsylvania Turnpike photo, above, was taken at the western end of the 1¼ mile Sideling Hill Tunnel—longest tunnel on the Turnpike.



This year you'll be driving more than ever before on throughways, expressways and turnpikes—at high legal speeds. For greater safety, you need Turnpike-Proved Tires by Goodyear.

**NEW RUBBERS!
NEW CHEMICALS!
NEW CORDS!**

New Turnpike-Proved Tires by Goodyear—built with phenomenal new rubbers, chemicals and cords—give up to 25% more safe mileage even on the turnpikes! That means, they'll give you more mileage no matter where or how you drive!

WE KNEW if we could build a tire to give more mileage on the turnpikes, it would give you more mileage *anywhere* you drive!

But first, Goodyear scientists had to solve two vital problems:

Problem #1—tread rubber: At high speeds, ordinary tread rubber is literally eaten away. But by *intimate mixing* of new chemicals and rubber molecules, Goodyear scientists created today's longest-wearing tread rubber for today's toughest driving conditions.

Problem #2—tire cord: At high speeds, heat also weakens cord. The answer? Goodyear's 3-T *triple-tempered* cord (Tyrex or nylon) with strength and heat resistance other cords do not have.

Proved on "The Turnpike That Never Ends." On Goodyear's 140-mph test track at San Angelo, Texas, these tires *proved* they'll give you more safe mileage than any other tires.

See them at your Goodyear dealer's. Goodyear, Akron 16, Ohio.

GOOD YEAR

MORE PEOPLE RIDE ON GOODYEAR TIRES THAN ON ANY OTHER KIND!

Watch "Goodyear Theater" on TV every other Monday evening.



The Technology Review

EDITED AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

CONTENTS FOR MARCH, 1959 VOL. 61, NO. 5

MARTIAN RECONNAISSANCE

Front Cover

Drawn by M.I.T. Instrumentation Laboratory
Technical Publication Group

FROM EARTH TO MARS

Frontispiece 232

AIR DEFENSE RESEARCH IN THE SPACE AGE

By Carl F. J. Overhage 239

Lincoln Laboratory is helping to assure American supremacy on a vital front by seeking more basic knowledge and planning more intelligent machines

WHERE WE STAND IN SPACE

By H. Guyford Stever 244

The uses and vehicles of space technology are numerous and the engineering problems, such as propulsion and guidance, exceed those in science right now

THE PROBLEMS OF COLLEGE ADMISSIONS—II

By B. Alden Thresher 247

Of the many unsolved problems in selecting students for higher education, those related to emotional factors leading to poor motivation are among the most difficult

THE TABULAR VIEW

226

Editorial changes and contributors to this issue

THE TREND OF AFFAIRS

233

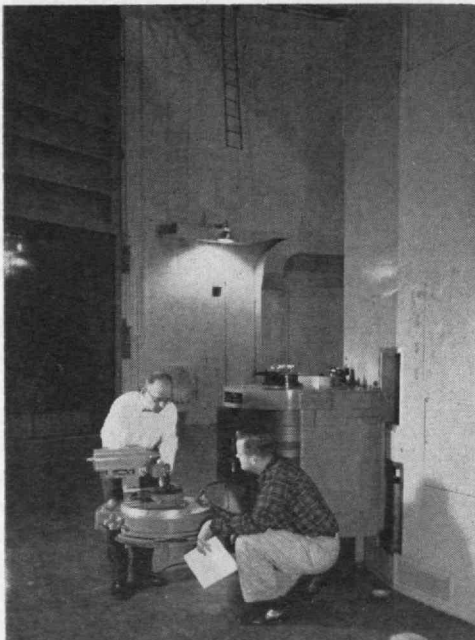
Relating to the Massachusetts Institute of Technology

EDITOR: Volta Torrey; BUSINESS MANAGER: R. T. Jope; CIRCULATION MANAGER: D. P. Severance; EDITORIAL ASSOCIATES: Paul Cohen, J. R. Killian, Jr., F. W. Nordsiek, J. J. Rowlands; EDITORIAL STAFF: Ruth King, Shirley G. Reese, Winifred R. Sibley; BUSINESS STAFF: Madeline R. McCormick; PUBLISHER: H. E. Lobdell.

Published monthly from November to July inclusive on the twenty-seventh of the month preceding the date of issue, at 60 cents a copy. Annual subscription, \$4.00; Canadian and foreign subscription, \$4.50. Published for the Alumni Association of the M.I.T.; John J. Wilson, President; H. E. Lobdell, Executive Vice-president; D. Reid Weedon, Jr., William W. Garth, Jr., Vice-presidents; Donald P. Severance, Secretary-Treasurer. Published at Hildreth Press, Inc., Bristol, Conn. Editorial Office, Room 1-231, Massachusetts Institute of Technology, Cambridge 39, Mass. Entered as second-class mail matter at the Post Office at Bristol, Conn. Copyrighted, 1959, by the Alumni Association of the Massachusetts Institute of Technology. Three weeks must be allowed to effect change of address, for which both old and new addresses should be given.

Professor Clifford G. Shull is seen below adjusting the mount on which a sample of material will be studied with a beam of neutrons from the new M.I.T. Nuclear Reactor. Kneeling beside the neutron diffraction spectrometer attached to the reactor is Rolf Soderstrom, a guest of the Institute.

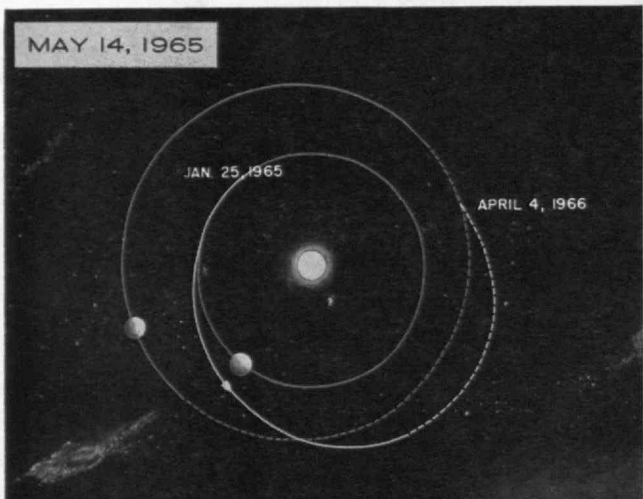
M.I.T. Photo



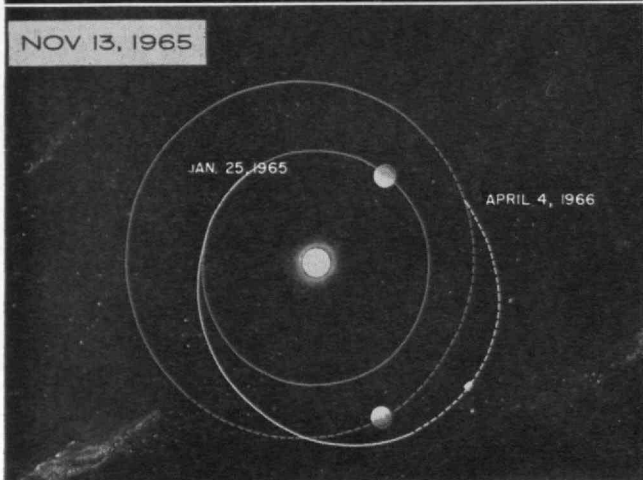
APRIL 4, 1966



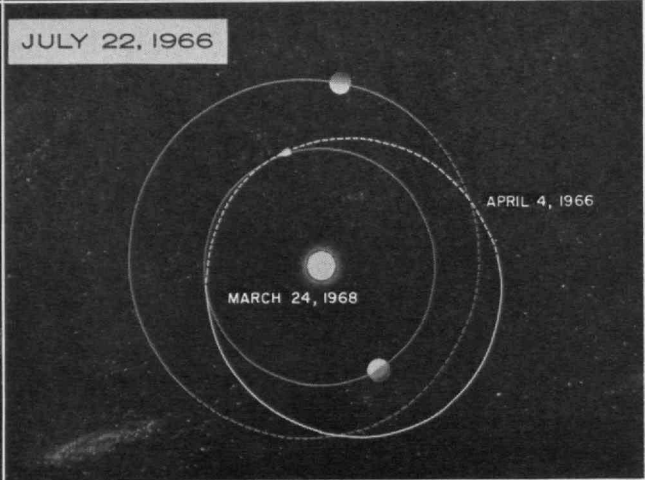
MAY 14, 1965



NOV 13, 1965



JULY 22, 1966



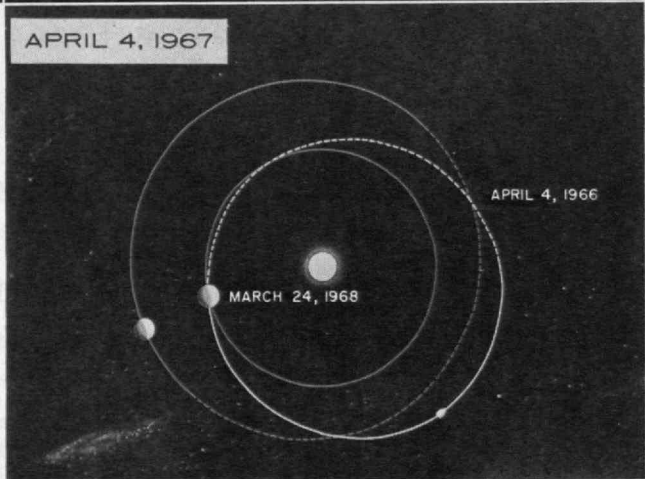
From Earth to Mars

A NEW technique for determining round-trip planetary reconnaissance trajectories was described recently for the Institute of the Aeronautical Sciences by Richard H. Battin, '45, of the Instrumentation Laboratory at M.I.T.

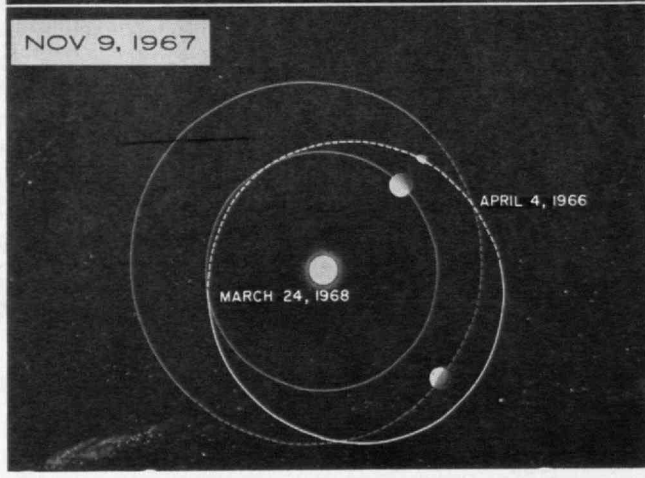
The two pictures above show the outbound path of an instrument-carrying spaceship, launched from earth with a relative velocity of 9,400 miles per hour on January 25, 1965, into a freefall orbit about the sun. Contact with Mars would be made on April 4, 1966, when the vehicle passed within about 5,000 miles of its surface. The relative orientation to Mars, as indicated in the upper right-hand corner, must be carefully controlled since the Martian gravitational field would alter the course. If the maneuver is properly executed, the ship would return to earth on March 24, 1968, without additional propulsion.

The other pictures at the right show various stages of the return trip. Solid lines indicate when Mars and the spaceship would be in orbital planes above the plane of the earth's orbit; broken lines indicate when the orbits of Mars and the ship would be in planes below that of the orbit of the earth. Conditions for a reconnaissance mission such as this prevail during an interval of several months and recur approximately every two years.

APRIL 4, 1967



NOV 9, 1967





The Trend of Affairs

From Great to Puny Brains

■ George R. Harrison, Dean of the School of Science, has dubbed those amazingly fast and helpful digital computers that International Business Machines Corporation and other concerns are producing "great big puny brains." If you want a tool to produce a certain part for an airplane, a computer can tell it how its cutting edge must be guided. Computers have done this many times, on many jobs, since Whirlwind I first ran a milling machine at M.I.T. seven years ago. But telling a computer what you want it to tell a machine tool is a tiresome, time-consuming chore — because even the biggest, fastest, most versatile electronic computers are "puny" brains. They must be carefully "programmed."

So a new language has been devised to simplify telling a computer what directions it must give to a machine tool when you want it to carve out a new part. This language consists at present of only 100 words, none of which contains more than six letters. It is a key part of a system called APT, which is a means of "Automatic Programming of Numerically Controlled Machine Tools."

Perhaps you already have read in your newspaper or trade publication about APT. Reporters flew to M.I.T. from New York and Washington in February to learn about APT, see it demonstrated, and attempt to describe it in language that people could understand. (This, too, is quite a trick.)

The APT vocabulary is easy to learn. Suppose, for instance, that you wanted the coolant turned on and the spindle of a tool started. In APT, you would simply write "ON KUL, ON SPN." Then, if you wanted the tool guided to the right on the left side along a circle, the center of which was where X equaled 2 and Y equaled 3, and the radius of which was 5, you could write (in APT) "GO RGT, TL LFT, CIRCLE/CTR AT, + 2, +3, RADIUS, 5." This is good enough language for a puny brain. When given such instructions, in this way, a computer can make the calculations and prepare the magnetic tape required by an automatic machine tool.

The APT system, of which APT language is only a newsy part, was based on research supported by the Air Force in the M.I.T. Servomechanisms Laboratory.

The Aircraft Industries Association has sponsored development of this system and is enthusiastic about it not only because it saves man-hours but also because it can bring about industry-wide compatibility and has been purposely designed for future growth and expansion.

A computer-programming assignment that formerly would keep a man busy for 200 hours now can be done the APT way in five hours. But the M.I.T. laboratory's staff consider what has been done thus far only an initial breakthrough. "Continued co-operative development of the APT concept by the aircraft industry," says Douglas T. Ross, '54, head of the computer-applications group, "will lead to increased productivity from numerical-control applications, and can influence many industrial processes."

The Ballots Are Ready

■ Ballots will be sent this month to the Alumni of M.I.T. for their use in electing officers of the Alumni Association for the year beginning next July 1. Three alumni term members of the M.I.T. Corporation will be proposed at the same time. The nominees are:

Edward J. Hanley, '24, to be president of the Alumni Association for one year;

William L. Taggart, Jr., '27, to be vice-president of the Association for two years;

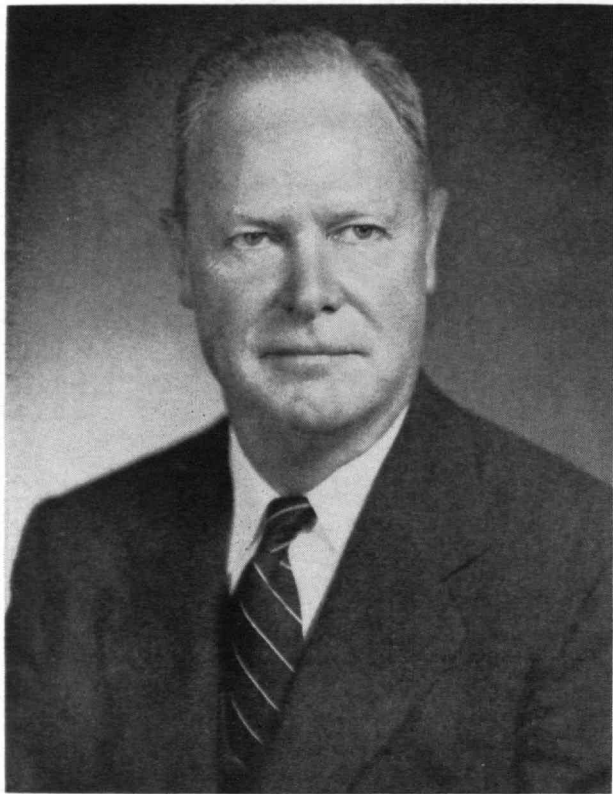
Henry B. Backenstoss, '34, and *Albert O. Wilson, Jr.*, '38, to be members of the Executive Committee of the Association for two years;

William Webster, '23, *John J. Wilson*, '29, and *James B. Fisk*, '31, to be alumni members of the M.I.T. Corporation for five years.

All of these men have worked previously in other capacities to advance the interests of the Institute. Portraits of Mr. Hanley, who is the sole nominee for the presidency of the Association, and the three nominees for alumni term membership on the M.I.T. Corporation are on the next page. One of the latter, Mr. Wilson, is serving now as the Alumni Association's 65th president and on the Corporation's Visiting Committees on Student Activity and on the Medical Department.

Messrs. Webster and Fisk have both distinguished themselves professionally and served their country in

Nominated for the Presidency of the Alumni Association



Deakin Studio

... Edward J. Hanley, '24, II, who has been nominated for the presidency of the M.I.T. Alumni Association, is president of the Allegheny Ludlum Steel Corporation in Pittsburgh. He is also a director of this company and of the Titanium Metals Corporation of America, the Duquesne Light Company, the Westinghouse Air Brake Company, the Mellon National Bank and Trust Company, the Mine Safety Appliances Company, the Bell Telephone Company of Pennsylvania, and the American Iron and Steel Institute.

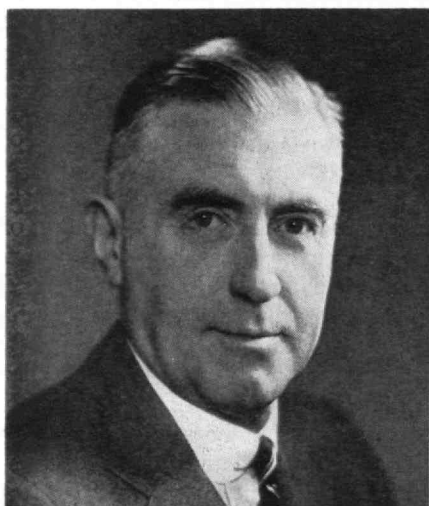
Mr. Hanley is a 1956-1961 alumni term member of the M.I.T. Corporation, and also has served the Institute and its Alumni in other roles for nearly three decades. He was president of the M.I.T. Club of Schenectady in 1930-1931, and a member of the Board of Governors of the M.I.T. Club of Western Pennsylvania in 1954. He has been on the Visiting Committee on the Department of Metallurgy since 1956, and its chairman for the last two years. He also was on the Visiting Committee on the Department of Chemical Engineering in 1956-1957, and is now a member of the Advisory Council of the School of Industrial Management.

His office is on the 20th floor of the Oliver Building in Pittsburgh, and his home is in Allison Park, Pa. He is a member of the Iron and Steel Institute (London), the Association of Iron and Steel Engineers, the National Association of Accountants, the Controllers Institute of America, and The Newcomen Society of North America. His clubs include the Duquesne and the Union League Club (New York).

important roles. Dr. Webster has been associated with the Department of Defense in matters regarding atomic energy, and research and development; he also has served on the National Advisory Committee for Aeronautics and the Army Scientific Advisory Panel. Dr. Fisk was director of the Division of Research in the U.S. Atomic Energy Commission, and a member of the General Advisory Committee of the commission, before being named to the President's Science Advisory Committee.

Mr. Taggart, the nominee for the vice-presidency of the Alumni Association, is executive vice-president of Dewey and Almy Chemical Company (Division of W. R. Grace and Company) in Cambridge, and is chairman of the 1959 Alumni Day Committee.

One of the nominees for election to the Executive Committee of the Association, Mr. Backenstoss, is project manager for Jackson and Moreland, Inc., in Boston; and the other, Mr. Wilson, is president and treasurer of the A. O. Wilson Structural Company.

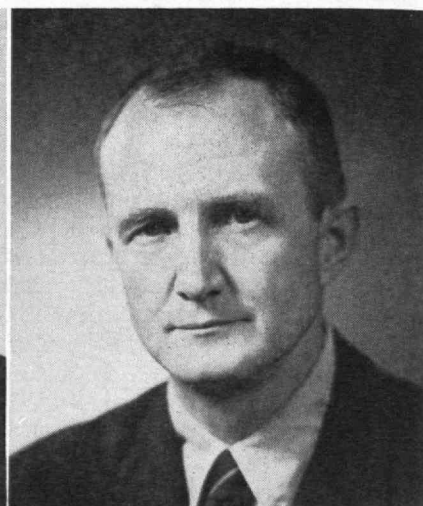


Fabian Bachrach

John J. Wilson, '29



William Webster, '23



Bell Telephone Laboratories

James B. Fisk, '31

Nominated to be alumni term members of the M.I.T. Corporation for five years starting July 1, 1959, are (from left to right) Messrs. Wilson, Webster, and Fisk. Mr. Wilson, who is now president of the Alumni Association, is a director of the Minneapolis-Honeywell Regulator Company. Dr. Webster is executive vice-president of the New England Electric System and president of the Yankee Atomic Electric Company. Dr. Fisk is president of the Bell Telephone Laboratories, Inc., and a member of President Eisenhower's Science Advisory Committee.

The present membership of the National Nominating Committee includes: John A. Lunn, '17, chairman, Philip L. Alger, '15, Edmund D. Ayres, '22, Cecil H. Green, '23, Max L. Ilfeld, '24, Hartselle D. Kinsey, '24, Ralph B. Johnson, '27, Jean M. Raymond, '34, Bissell Alderman, '35, and Henry Avery, '41.

This year's ballots also will carry the names of the following nominees (with one Alumnus to be elected from each District) to be representatives for three years on the National Nominating Committee: *District 8* — San Juan, Puerto Rico — Antonio S. Romero, '12; Havana, Cuba — Antonio H. Rodriguez, '21; Knoxville, Tenn. — George P. Palo, '28; Oklahoma City, Okla. — Charles B. Stuart, '34; — *District 9* — Kansas City, Kansas — William R. Wheeler, '25; Duluth, Minn. — Arthur C. Josephs, '28; — *District 10* — Portland, Ore. — E. Robert deLuccia, '27; Seattle, Wash. — Jacob A. Samuelson, '40.

The following classes, whose numerals end in five or zero, also will vote for representatives to serve for five years on the Alumni Council: 1895, 1900, 1905, 1910, 1915, 1920, 1925, 1930, 1935, 1940, 1945, 1950, 1955.

Individuals Noteworthy

■ Prominent in the news since the advent of 1959 have been the 34 promotions, elections, or appointments enumerated below:

Frank M. Carhart, '05, as Chairman of the Board; *Ralph D. Booth*, '20, as President; *John R. Coffin*, '17, as a Senior Vice-president; and *Henry W. Hills*, '20, *Alexander J. Tigges*, '23, *Leo J. Myskowski*, '28, and *Arthur Y. Taylor*, '46, as Vice-presidents, Jackson and Moreland, Inc.;

Whitworth Ferguson, '22, as a Director, Buffalo Branch, Federal Reserve Bank of New York . . . *Robert C. Sprague*, '23, as Chairman of the Board, Federal Reserve Bank of Boston . . . *George J. Leness*, '26, and *William A. Forrester, Jr.*, '26, respectively, as Chairman of the Executive Committee and as a Director, Merrill, Lynch, Pierce, Fenner, and Smith;

David A. Shepard, '26, as Executive Vice-president, Standard Oil Company of New Jersey . . . *Nathan Cohn*, '27, as Vice-president — Technical Affairs, Leeds and Northrup Company . . . *Henry G. Houghton*, '27, as Council member, American Meteorological Society;

William J. Kirk, '28, as President, John P. Chase, Inc., investment counsel, Boston . . . *Alfred T. Waide-lich*, '30, as Director of Engineering and Research, the Austin Company, Cleveland . . . *Donald A. Holden*, '31, as Vice-president and Production Manager, Newport News Shipbuilding and Dry Dock Company;

Thomas E. Sears, Jr., '32, as President, Thomas E. Sears, Inc., Boston . . . *Harner Selvidge*, '32, as President, Soaring Society of America . . . *Richard M. Stewart*, '32, as a Director, Bullard Company, Bridgeport, Conn. . . . *David B. Smith*, '33, and *Donald G. Fink*, '33, respectively, as Vice-president for Technical Planning and as Director of Research, Philco Corporation;

Beaumert H. Whitton, '33, as President, Southeastern Construction Company, Charlotte, N. C. . . . *Edward W. Comings*, '34, as Dean of Engineering, University of Delaware . . . *Robert F. Flood*, '35, as Vice-president, Linde Company Division, Union Carbide Corporation;

On the Horizon

March 12-14, 1959 — 11th Annual Fiesta, M.I.T. Club of Mexico, Mexico City, D.F. (For reservations, consult Clarence M. Cornish, '24, Margaritas 257, Villa Obregon, Mexico 20, D.F., Mexico.)

June 15, 1959 — 25th Alumni Day, 1959. M.I.T. Campus in Cambridge.

Henry C. Johnson, '36, as Chairman of the Board and President, Phil Wood Industries, Ltd., Windsor, Ont. . . . *Franklin S. Atwater*, '38, and *Harold M. Brodsky*, '47, respectively, as Vice-president — Manufacturing and as Manufacturing Manager of Branch Plants, Fafnir Bearing Company, New Britain, Conn.;

William S. Brewster, '39, as Vice-president, United Shoe Machinery Corporation . . . *Rodrigo Uribe*, '41, as *Ministro Consejero* of the Embassy of the *República de Colombia* to the United States . . . *S. James Spitz, Jr.*, '43, as Vice-president, Newport Industries, Inc., Pensacola, Fla.;

Gunter H. Baldauf, '44, as Research Manager, Allied Paper Corporation . . . *Lester Simon*, '44, as Vice-president, R. A. Ransom Company, Inc., Portland, Maine . . . *Melvin E. Salveson*, '47, as President, the Institute of Management Sciences.

■ Special honors recently announced or awarded to Alumni and members of the Faculty include:

To *William L. Stewart, Jr.*, '23, the Trans-Oceanic Pennant, by the Cruising Club of America . . . to *Charles S. Draper*, '26, and *Robert G. Loewy*, '48, respectively, Honorary Fellowship and the Lawrence Sperry Award, by the Institute of the Aeronautical Sciences;

To *Doyle L. Northrup*, '31, the Distinguished Federal Civilian Service Award, by President Eisenhower . . . to *James G. Potter*, '33, its Distinguished Service Citation, by the American Association of Physics Teachers.

The Complete but Gentle Squelch

■ When Harold E. Edgerton, '27, Professor of Electrical Measurements at the Institute, was named Outstanding New England Engineer of 1958, press photographers visited his laboratory and asked him to show them how to stop a bullet photographically. Again and again and again in a darkened room, Dr. Edgerton held a balloon in front of a rifle while an aide fired a bullet through it into the end of a pipe full of sand. Each shot triggered a light that flashed on for 1/2,000,000th of a second. Bullets were caught entering, inside, and coming out of the balloons. "Got it?" the weary doctor asked at long last. "One more, please," said the photographers from force of habit. So another balloon was burst. This time a sharp ping followed the gun's bark. Did the bullet ricochet into the room off the pipe's end? No one asked for another shot. . . . In a far corner, one of Dr. Edgerton's friends had tapped a bit of metal with a hammer. That broke the habit.

Permanent Office for Religious Counselors

■ The importance of religion in the lives of students, Faculty, and staff at the Institute has long been recognized. When the student body was smaller than it is today and a larger percentage of students were commuters, the spiritual and religious needs of the Technology community were administered entirely by the churches in Boston and vicinity. Since the 1940's, however, religious counselors have been available on campus.

At the close of World War II, more students than ever before sought higher education. A large number were veterans and many were married and had families. Among this mature group there was a strong urge to seek meaning in life. The concept of technical education was being broadened in recognition of the fact that the uses to which technology was being put were of concern to those who would advance science and engineering in their professional work.

As M.I.T. became increasingly a residential college, the M.I.T. Chapel was built and the part-time counselors found their services to be in ever-expanding demand. In thus broadening higher education, the Institute has made its own contribution to the development of the student's total experience.

Frequently the religious counselors are called upon to help students solve emotional or other personal problems, for many students find themselves away from home for an extended period for the first time in their lives, or may have difficulty adjusting to college life. Although performing a distinctly different function, the religious counselors frequently work closely with the Institute's Faculty advisers, the Deans, and the personnel in the Medical Department. The services of these counselors had assumed such magnitude and importance by last year that more adequate office quarters in the residential area of the M.I.T. campus seemed desirable.

Another important step was taken, therefore, to make religious counseling more readily available. The Institute acquired a private dwelling at 317 Memorial Drive, a short distance west of Massachusetts Avenue, and converted this four-story structure into a permanent headquarters for the religious counselors. Furnishings for the new center were provided by the Advisory Board of the Technology Community Association, and each room is quietly and tastefully decorated.

The Reverend J. Edward Nugent, religious counselor for Catholic students, Rabbi Herman Pollack, counselor for Jewish students, the Reverend Robert C. Holtzapple, Jr., counselor for Presbyterian and Congregational students, and the Reverend Myron B. Bloy, Jr., counselor for Episcopal students, have offices in the new headquarters. These men spend their full time at M.I.T. A dozen other religious counselors also have stated office hours, and an even larger number are available on call. They, too, on a part-time basis, share in the facilities provided by the new building.

Many different religious services are held in the M.I.T. Chapel regularly, and it is open daily for private meditations.



This is the reception room of the Institute's new headquarters for its religious counselors, at 317 Memorial Drive, a short walk from Massachusetts Avenue and the main M.I.T. building.



Three secretaries are kept busy handling the details of counseling for Institute students in this office adjacent to the reception room. The window overlooks the Charles River.



M.I.T. Photos

The religious counselors have private offices on the second and third floors of the recently renovated four-story building. The study shown here is used by the counselor to Catholic students. There is also a seminar room. Thus appropriate facilities have been provided for friendly discussions of the religious problems of young people preparing for their careers. The counselors work closely with the Faculty and the deans.

The Charles River Basin Project

■ Fifty-six years ago the Massachusetts legislature authorized a dam in the Charles River to eliminate unsightly mud flats, and create between Boston and Cambridge a beautiful expanse of water such as few cities in the world enjoy. The Charles River Basin is a front yard of priceless value for the whole area and this setting was a major consideration in the planning of the M.I.T. buildings.

But 40 acres of the river bottom on the Cambridge side, which had remained in private ownership when the basin was created, now belong to John Briston Sullivan, a Cambridge real estate man, who decided that he could erect, on stilts driven into the mud, a multimillion dollar commercial development. He has a bill in the legislature to shift jurisdiction of the area from the Metropolitan District Commission, which wants to keep the Charles River Basin for public use, to the City of Cambridge, which could rezone the land for industrial use.

Buildings covering the 40 acres would extend nearly halfway across the river from the Cambridge shore, ruining the vista. They would stretch up the river from the Longfellow Bridge past part of M.I.T. Needless to say, M.I.T., Arthur D. Little, Inc., and other neighbors, as well as all citizens who are interested in preserving the area, are opposed to the bill and are expressing their opposition in letters to their legislators and newspapers.

"This is as much the public domain as the Grand Canyon or Yellowstone National Park," said Louis M. Lyons in a newscast on WGBH-TV. "It would be immoral to give to a private commercial interest the right to take it away from the people for whom it was created."

At the Institute This Summer

■ The 1959 Summer Session at M.I.T. will attract more than 3,000 students. About half of them will be supplementing fall and spring work; the others will be professional visitors, updating or refreshing their knowledge of specialties. The latter will bring on-the-job knowledge and experience which is greeted with enthusiasm at the Institute. Most of them will take intensive short courses (running from one to three weeks), about which more may be learned by writing to Professor James M. Austin, '41, Director of the Summer Session. These special courses this summer will deal with important aspects of:

- Adhesion: Theory and Practice (Building Engineering)
- Aesthetics of Surfaces (Architecture)
- Bearing Technology (Mechanical Engineering)
- City and Regional Planning
- Controllershship (Industrial Management)
- Corrosion (Metallurgy)
- Direct Conversion of Heat to Electricity
- Finite- and Infinite-State Machines
- Food Protection Factors (Food Technology)
- Industrial Dynamics (Industrial Management)
- Industrial Photoelasticity (Mechanical Engineering)
- Infrared Spectroscopy (Chemistry)
- Institutional Expansion (City and Regional Planning)
- Long-Range Radio (Electrical Engineering)
- Marketing Strategy and Tactics (Industrial Management)



The area shown in white is the portion of the Charles River Basin which the Institute and others have rallied to defend.

- Materials for Parachutes (Mechanical Engineering)
- Mechanical Properties of Plastics
- Modern Thermodynamics (Mechanical Engineering)
- Organization for Research (Industrial Management)
- Plasma Dynamics (Physics)
- Probability Theory Applications (Operations Research)
- Quantitative Approaches to the Study of Neuroelectric Activity (Electrical Engineering)
- Scientific and Engineering Reports (Humanities)
- Shear Strength of Soils (Civil Engineering)
- Strain Gauges (Mechanical Engineering)

From Missiles to Schools

■ Detroit engineers showed visitors from M.I.T. a new kind of industrial plant, and Julius A. Stratton, '23, President of M.I.T., sketched a new kind of education for them, when about 500 Alumni and friends of the Institute met on January 31 for a Regional Alumni Conference. Arranged by the Detroit M.I.T. Association, it brought scientists, industrialists, engineers, and educators together to consider the future of atomic power, space flight, defense laboratories, and the democratic process.

Thomas F. Morrow, '35, Vice-president of the Chrysler Corporation and chairman of the committee responsible for the gathering, gave his guests from Cambridge a preconference tour of a 2,100,000-square-foot missile factory. Owned by the U.S. Army but run by auto makers, this plant was built to turn out jet engines. Instead, its 11,000 employees and long assembly lines now mass produce those gigantic arrows called Redstones and Jupiters. C. Allan Brady, general manager of this great array of tools, jigs, and testing instruments, and his assistant B. J. Meldrum, showed the deans and professors how up to 300,000 parts are welded, tacked, and intricately linked together in many modern ways to become complete ballistic missile systems.



At the Detroit missile plant (from left to right): John J. Wilson, '29, of Boston; Donald Dresselhouse and B. J. Mel drum of Chrysler Corporation; and Dean Burchard.

Dr. Stratton, the next evening, spoke of the upheaval in engineering education that has resulted from scientific discoveries and the acceleration of industrial progress. The immensity of both of these forces had been everywhere apparent in the missile plant. "Science on the one flank, and industry on the other," the Institute's president said, "are setting the pace." Changes are being considered, consequently, both in the curricula and in the approach to the education of an engineer."

Dr. Stratton reviewed four movements — the expansion of the frontiers of science, the deepening of the theoretical base of engineering, the fusion of fields of engineering, and the increasing importance of research — which have reverberated through the classrooms. "Getting an education at M.I.T.," he was told by one student, "is like getting a drink from a fire hose." Nevertheless, Dr. Stratton concluded, "With all our groping, I think that we shall find a proper balance for the future."

The keynote of the Detroit conference had been sounded earlier by George R. Harrison, Dean of the School of Science. Since the first Sputnik went up, he reported, the curricula in more than one-fourth of our high schools have been changed for the better. Now the Russians' Lunik 1 has provoked us again into giving more attention to science.

Dean Harrison's anecdotal survey of science and its future prompted one auditor to say, "They've put their best hitter up first"; but more hits came throughout the day. Professor Theos J. Thompson, Director of M.I.T.'s Nuclear Reactor, was the second man up, and he scored by describing and answering questions about the nuclear power reactors and the nuclear research with reactors that is under way in Michigan, Massachusetts, and Pennsylvania.

H. Guyford Stever, Professor of Aeronautics and Astronautics, then listed the engineering problems of space flight, and Carl F. J. Overhage, Director of Lincoln Laboratory, showed pictures of the laboratory and discussed defense research in the space age. Articles based on their addresses appear elsewhere in this issue of *The Review*.

Democracy's future, John E. Burchard, '23, Dean



At the Detroit Alumni Conference (from left to right): W. D. J. MacDonnell, '34, of the Great Lakes Steel Corporation; President Stratton; and Mr. Wilson.

of the School of Humanities and Social Studies, maintained in the afternoon's final address, depends on the citizen's ability to ask the right questions and participate in debate about problems vital to the nation. The liberal arts colleges, he suggested, should see to it that educated men and women are aware of the problems of scientists — for the same reason that schools such as M.I.T. now require prospective scientists and engineers to study the humanities and social sciences.

Charles A. Chayne, '19, Vice-president of General Motors, was moderator of the morning session, and James C. Zeder, Vice-president of Chrysler Corporation, introduced the speakers in the afternoon. Then Robert B. Semple, '32, President of the Wyandotte Chemicals Corporation, presided while all of the speakers sat as a panel and dealt with questions from the floor.

W. D. J. MacDonnell, '34, President of the Great Lakes Steel Corporation, was toastmaster at the banquet which followed, and John J. Wilson, '29, President of the Alumni Association, spoke briefly about the Association's activities, before President Stratton related the day's remarks to the education of future engineers.

In the lobby between sessions and at the reception preceding the banquet, there was much talk of small-versus-large cars — and laughter as space-age stories were told. A favorite was the one about two Russian scientists who knocked at the gates of Heaven. St. Peter responded and said he was sorry but he could not let Communists in. "We know that," said one of the Russians. "We just came to see if you would give us back our ball."

For Mr. Morrow, the conference chairman, it was indeed a busy Saturday. He dined that evening in Washington, to accept a citation for his company's defense work. But the program went smoothly on at Detroit, thanks to vice-chairman Robert J. Meier, '41, and a committee consisting of Morgan A. Collins, Jr., '27; Patrick E. Colvan, '48; Robert M. Gaudin, '52; Roy C. Haeusler, '32; Charles M. Jordan, '49; W. James Mast, '53; John D. Rumsey, '33; David M. Sutter, '26; and Jervis C. Webb, '37.

(Continued on page 252)

Air Defense Research in the Space Age

Lincoln Laboratory is helping to assure American supremacy on a vital front by seeking more basic knowledge and planning more intelligent machines

by CARL F. J. OVERHAGE

THE fact which dominates our lives in this space age is that two great powers are competing for world leadership. In the past, such situations have often been resolved by warfare, and thus a good deal of thought is now being given to the possibility of a third and thermonuclear world war. We are determined to avoid such a war. We hope to do this by establishing a military equilibrium between the United States and its potential enemies.

Toward this end, we are steadily expanding and improving our early warning systems, so that no enemy will assume that, without danger to himself, he can annihilate us in a single massive surprise attack. We are building up our active defenses against both aircraft and missiles, so that an effective attack will become more and more costly to an enemy. And we are

constantly adding to the power of our strategic weapons so that an enemy will not contemplate an attack on the United States without the certain knowledge that he is exposed to immediate counterattack.

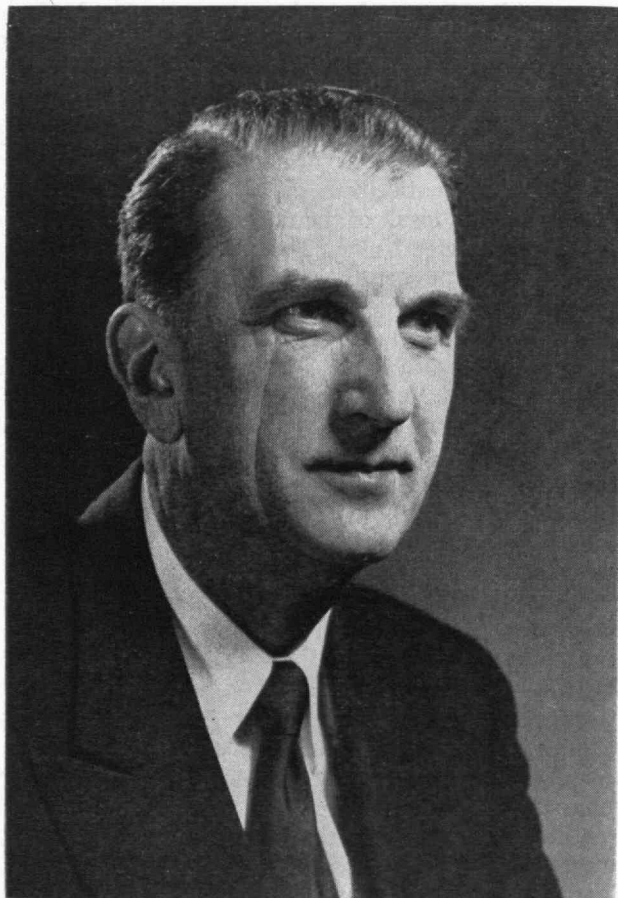
As we gradually achieve these objectives, it is becoming apparent that the front on which the issue of world leadership is really going to be settled is that of science and technology. The peoples of the world are determined to avoid thermonuclear conflict. I believe that they will, of their own volition, align themselves with the side that establishes a clear superiority in science and technology. For it is in science and technology that the masses of Asia and Africa seek their salvation. It is in science and technology that we compete with communism for the control of the underdeveloped countries. And it is in science and technology that the Soviet Union is intent on matching and surpassing the United States.

My insistence on science and technology as the primary issue may sound a little brash. I am not deaf to the civilized voices of George Kennan and of Barbara Ward, of Paul Henri Spaak and of Walter Lippmann. Science and technology is not the only front on which we have to fight. But it is the front of which I have some firsthand knowledge, and I have become firmly convinced that if we fail on this front the Western cause will be lost.

Technical Centers

Our American resources in science and technology are substantial. In the leading position, we have our universities and their academic research institutes. Here the primary motivation is to secure the continuity and stimulate the advancement of the system of thought and knowledge which constitutes Western civilization. Next, we have our government laboratories, dedicated to research in specific directions in which Congress and the Administration seek to promote the welfare of the nation. Third, we have our industrial research laboratories, where a vigorously expanding effort is under way to provide the technological foundations for new commercial products and services. Finally, we have a fourth and new type of establishment: a group of technical centers operated under government contracts by some of our major universities.

In this last category, which has its origins in World War II, we find a concentration of effort in those new fields of science and technology that are most perti-



Dr. Overhage became associated with M.I.T. during the war, helped organize Lincoln Laboratory, and is now its director.



The Lincoln Laboratory of M.I.T., near Hanscom Field in Lexington, has four main buildings with a total area of 300,000

square feet. There are also shops and service buildings and a prototype air defense direction center (seen at the left in rear).

ment to our military needs. For example, in its laboratories at Los Alamos, at Berkeley, and at Livermore, the University of California works on the problems of nuclear weapons. The Jet Propulsion Laboratory at California Institute of Technology is concerned with rocket technology. The program of the James Forrestal Research Center of Princeton University includes research on fusion reactions. Columbia University is operating the Hudson Laboratories for investigations related to undersea warfare. And at Lincoln Laboratory, M.I.T. has organized a technical center for advanced electronics with special attention to air defense applications.

These technical centers are large enterprises. Lincoln Laboratory's size can be judged from the photograph on this page. Even so, much of our experimental work is done at field stations away from the central laboratory. These include a radar site 120 miles north of us in Maine, with a rather unusual air surveillance radar; a more recent radar of this type on a site near Andover, Mass.; and a communication research site by the ocean on a handsome estate which was given to M.I.T. by the family of its late owner, Colonel E. H. R. Green.

The Institute's Responsibility

Most of the physical facilities are the property of the United States Air Force. Lincoln Laboratory, as an operation, is staffed and managed by M.I.T. under a contract in which funds are jointly provided by Army, Navy, and Air Force, with the largest contribution coming from the Air Force. Lincoln Laboratory is thus a part of M.I.T., and we have many intellectual and

administrative ties with the Institute, although we are separated by 15 miles from the campus in Cambridge.

The involvement of M.I.T. in this enterprise goes back to 1951, and the circumstances that led the Institute to engage in a large activity so far removed from its primary task of education are interesting. First of all, the appeal from the Air Force to M.I.T. came at a time when the nation was confronted with a sudden emergency as a result of the unexpected atomic explosion in the Soviet Union. The new threat of atomic attack against the continental United States, by high-speed aircraft in large numbers, called urgently for a drastic new approach to our air defense. Such an approach had already been suggested by a committee under George E. Valley, Jr., '35, Professor of Physics at M.I.T. Centralized control of the air battle over a vast area had become possible with postwar advances in high-speed computers; radar data could be automatically inserted into these computers; command instructions to interceptors and missiles could be issued by the computers with a minimum of human supervision. These ideas had grown from roots deeply embedded in the work of several M.I.T. laboratories—notably the Radiation Laboratory, the Research Laboratory of Electronics, and the Digital Computer Laboratory. The existence of these resources in experience and talent at M.I.T. made it impossible to escape the responsibility for translating the new concept from a committee report to an operating reality. The decision to accept the job was in the best tradition of an institution which, in the words of J. A. Stratton, '23, President, is characterized by a "relatedness to the world of action as well as to the world of thought."

The system which resulted from this work came to

be called SAGE (Semi-Automatic Ground Environment); we have carried its development to the point where the first two of 29 SAGE air defense sectors are in operational use. The remaining sectors are in varying states of completion, and all necessary equipment is in commercial production. The nerve center of each sector is a Direction Center, where a four-story building houses two special computers, each with more than 60,000 vacuum tubes. The nation's total capital investment in this electronic network will be well over a billion dollars.

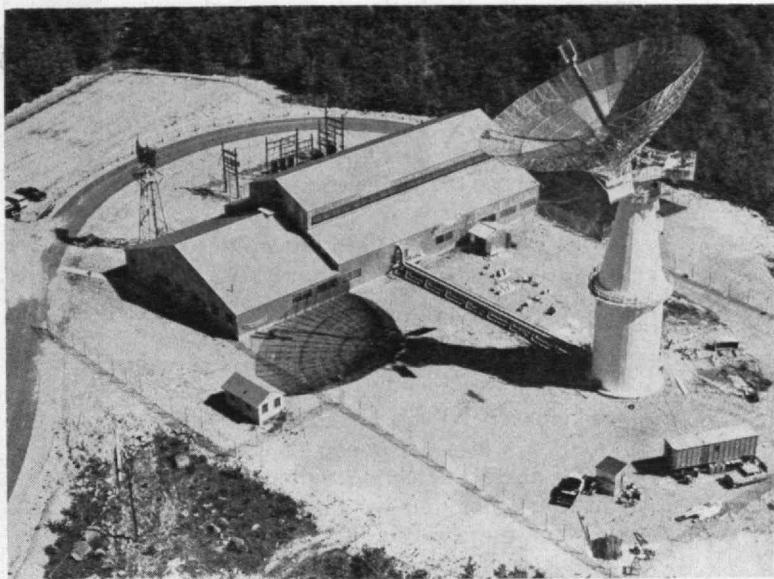
At this stage, the big problems are in the area of system integration and system management, and these problems are outside the field in which M.I.T. as a public educational trust believes it can properly engage. Therefore M.I.T. is now taking steps, with Air Force concurrence, to separate the tasks of SAGE System engineering and management from Lincoln's continuing research and development pursuits, and to transfer the SAGE activities to a new nonprofit organization, the Mitre Corporation, which will be independent of M.I.T.

Defense against Ballistic Missiles

Turning now to the space age, what new problems do we encounter in air defense? First of all, what exactly do we mean by the "space age"?

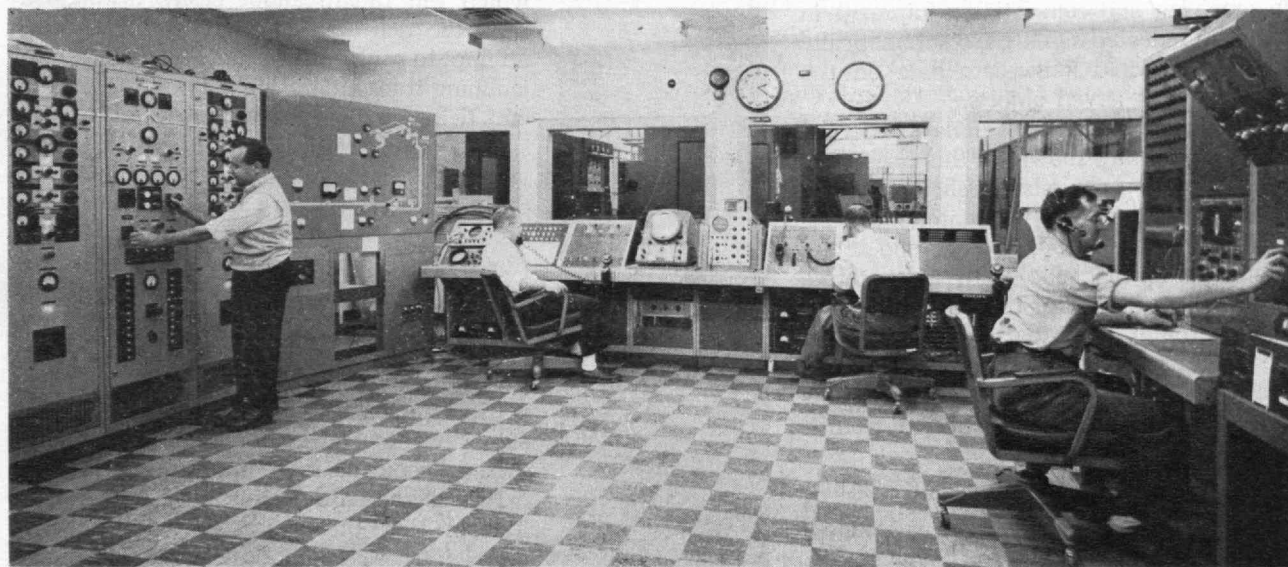
As we leave the surface of the earth, the density of the air decreases, and at an altitude of 20 miles or roughly 100,000 feet we are on top of 98 per cent of the total air that surrounds our planet. Above this level, the air is too thin to support normal aircraft or balloons. To penetrate this higher region, we need vehicles propelled by rockets. Such vehicles have become practical during the last 15 years. They have not yet been used to transport human observers, but this is rather imminent, and meanwhile a good deal has been learned from instrumented missiles.

A space vehicle is propelled by its rocket engines for only a brief period at the beginning of its journey. During this interval it rises beyond the atmosphere



On Millstone Hill in Westford, 30 miles northwest of Boston, Lincoln Laboratory has this large radar research installation. Its 84-foot reflector is mounted 90 feet above the ground.

and acquires a very high velocity. It is then separated from its power plant and continues on its journey without external constraints other than gravity. Its initial velocity may be adjusted so that its trajectory is relatively short; in that case, the vehicle re-enters the atmosphere a few hundred or a few thousand miles away from its launching point, and we speak of a ballistic missile. If the velocity is raised to about 18,000 miles per hour, the vehicle can be directed into an elliptical orbit entirely outside the earth and its atmosphere. We then speak of a satellite, and, if the lowest point of its orbit is high enough to make the atmospheric drag negligible, the satellite vehicle will keep circling the earth for many months or even years. A third type of space vehicle, with a still higher initial velocity, is designed to escape from the earth altogether and to be drawn into an orbit around the moon, or one of the nearer planets. These are the space



In the Millstone Hill control room, radar reflections from the aurora and space vehicles have often been recorded.

Several times, vehicles launched from Cape Canaveral have been seen and information obtained about their trajectories.

probes, with which the Army and the Air Force are currently experimenting.

Our specific interest at Lincoln Laboratory is in the detection and tracking of these objects. They are generally invisible, and we must depend on radio and radar techniques to sense the presence of these vehicles in space.

In air defense, we must be prepared to deal with missiles that are unwilling to cooperate with us by emitting suitable radio signals, and we are therefore concentrating our attention on radar observations in which we transmit our own signal and listen to the echo reflected by the object in space. This technique, which has been so successfully used for aircraft detection, will also work for ballistic missiles, but we shall have to cope with some quite substantial new difficulties. The objects are very much smaller than aircraft; they travel at very high speeds; and if proper warning is to be given of their approach, they have to be detected very far away. Therefore our radars must be very large and powerful, and our technology in this field must be stretched well beyond its present limits. Then, too, we find that radar signal transmission at these great altitudes and ranges is affected by the aurora, by meteors, and by polarization effects in the ionosphere. A lot of experimental research will have to be done before we can competently deal with these matters.

Our Millstone Hill Observatory, shown on page 241, was specifically designed for the study of this type of radar problem. The observatory site is dominated by an antenna with an 84-foot parabolic reflector mounted 90 feet above the ground. This antenna can be pointed toward any direction in the sky, and it can be moved with sufficient speed to follow a rapidly moving object. The antenna is fed from a high-power transmitter in the building at the left. The same buildings contain receiving and computing equipment in which the reflected signals are automatically processed to yield immediate data on the orbits of the observed objects.

Some records of actual signals observed with this radar are shown on this page. The group at the top consists of reflections from an aurora, the group in the center shows reflections from the moon, and the one at the bottom shows the echo from the satellite 1957 Alpha — the first of the Sputniks — as it passed through the radar beam. You will note the interesting differences. Broad patterns are characteristic of extended reflectors, and a sharp echo is returned from a much smaller satellite object.

While we have pursued our investigations with this research radar, the Air Force and

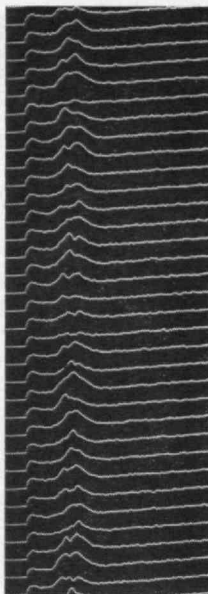
Army have been launching assorted space vehicles from the Missile Test Center about 1,000 miles away at Cape Canaveral, Fla. After they have attained sufficient altitude, these vehicles can be seen with the Millstone Hill radar, and we have on several occasions interrupted the scientific program at our observatory in order to provide operating information on vehicle trajectories. The sense of participation in these space launchings has been a thrilling experience to the Lincoln Laboratory, but what has been even more rewarding is the use of Lincoln Laboratory designs for the radar detection and tracking equipment that will be used in the arctic stations of the Air Force Ballistic Missile Early Warning System.

Active Defense

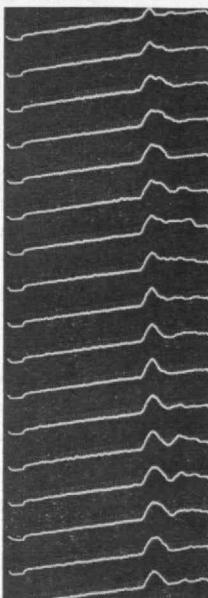
So far, I have talked of the detection and tracking of space vehicles, and I have implied that the orbit of the vehicle can be determined from radar data. If the vehicle is a ballistic missile rather than a satellite, the orbit will define its probable point of impact and point of origin. I need not point out the air defense implications of such data. But having detected a missile and identified its orbit as hostile is not enough. We are still faced with the problem of intercepting and destroying it. This is the so-called active phase of air defense. Here the electronics engineer shares the stage with the missile designer and the nuclear weapons specialist, and the security people see to it that the whole performance takes place behind a closed curtain.

I can only suggest the nature of some of the difficulties that must be overcome. The hostile ballistic missile that carries an atomic warhead may be accompanied by so-called decoys, light and inexpensive objects which travel through space on the same orbit, and which the radar cannot easily distinguish from the real article. The enemy may also attempt to confuse our radars by signals from jamming transmitters. He may try to saturate our defenses by launching several closely spaced small warheads instead of a single large one. In working toward solutions of these problems, we are badly handicapped by not knowing nearly enough about the physical phenomena associated with the entry of a space vehicle into the atmosphere. We are trying to acquire this knowledge by making observations at the far end of our own test ranges, but this is a slow and expensive program. To the greatest possible extent we must therefore seek to explore these phenomena in laboratory experiments.

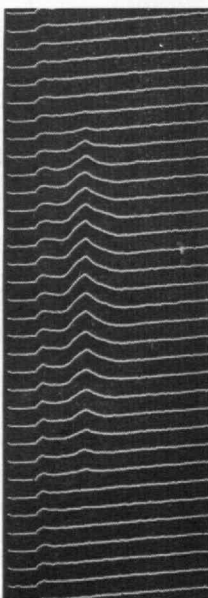
It is characteristic of technical centers like Lincoln that they operate under a very broad interpretation of their task. In addition to the projects aimed at specific new weapons, one will always find development



Aurora



Moon



Satellite

Patterns of radar signals reflected from the aurora and moon (at right above) are broad compared to the sharp returns from a much smaller satellite.

programs in the fields of component technology. And most important of all, one will find substantial efforts to advance the underlying scientific understanding in these fields, even if the military applications are not immediately apparent.

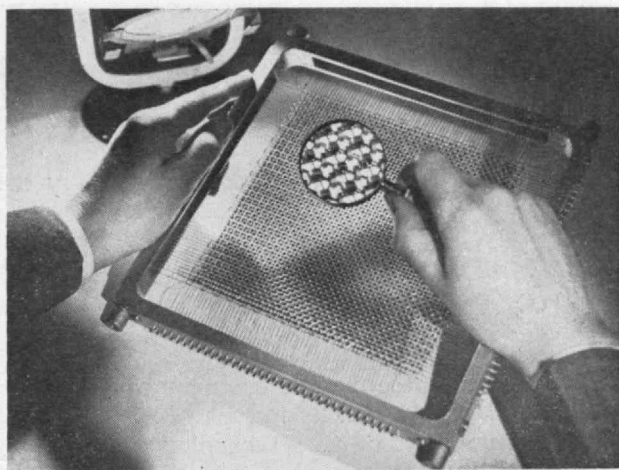
Solid State Research

Solid state physics is one of the broad areas in which we are seeking at Lincoln Laboratory to advance our general scientific insight. This is a very young science. It was only after the development of quantum mechanics in the period between World Wars I and II the physicists began to grasp the nature of the solid state.

Late in the forties, the transistor was invented at Bell Telephone Laboratories. The impact of this discovery on computer technology is suggested by a photograph on this page. It shows three subassemblies that are roughly comparable in function. The largest is representative of the 1950 technology utilized in the SAGE computer. The intermediate circuit is typical of the 1955 generation of circuits in which transistors have replaced vacuum tubes. This type of assembly is utilized in our computer at Millstone Hill. The smallest circuit was built in 1958.

In the design of computers, an equally important application of solid state physics was the ferrite memory core. M.I.T. has played a pioneering role in the development of this device which has been utilized in the high-speed memories of most of the modern computers. These cores are about 80 thousandths of an inch in diameter. They are wired in memory planes, each one of which contains 65,000 of these ferrite cores. There are 37 such planes in the memory of Lincoln's TX-2 computer.

With these two developments in mind, you will understand our faith in the value of further solid state



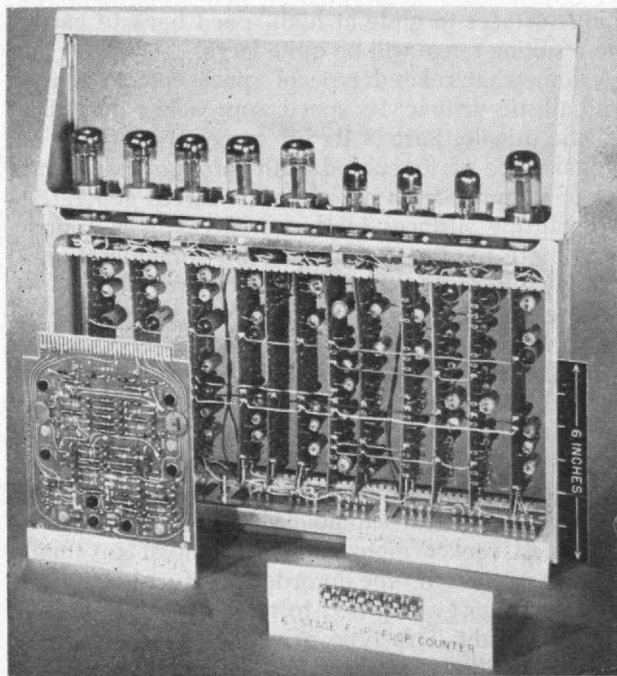
Memory cores like these in the TX-2 computer hold 2,500,000 bits of information. Recall time is six microseconds.

studies. Under the leadership of Benjamin Lax, '49, one of the country's outstanding solid state teams has been built up at Lincoln Laboratory. The pages in the scientific journals which contain the achievements of that group are, in my view, as important a contribution to national security as the radars of which I spoke earlier.

Man-Machine Communication

Another research area in which we believe the potential rewards are very large is the field of intercommunication between men and machines. We have been led into this field primarily by our work with computers. Compared with the high sophistication of the internal works of these machines, we have long felt at Lincoln Laboratory that their input and output devices are rather pedestrian affairs. Our TX-2 computer can multiply 10-digit numbers with each other in 15 millionths of a second. But when it comes to accepting instructions, the computer likes to have the operator punch a keyboard. At most it will take electrical pulses stored on a magnetic tape. Why should it not learn to understand plain English? And what is so insuperably difficult about reading a printed page? These are accomplishments that the more intelligent machines of the future will surely have, and we are working toward this goal by projects in speech recognition and in pattern recognition. We do not believe that the answers are just around the corner, but the challenge is persistent.

While this survey of our work has had to be fragmentary, it will have shown that our program extends from fundamental investigations in science through technological development to the design and construction of complex weapon systems. This broad "spectrum" of activities is based on a strong conviction that enduring competence can be achieved only where these different types of work are carried on side by side, under the same roof, by a single integrated team. I believe this is more than a crotchety academic notion: I believe it is the translation into practice of the principle I tried to suggest at the beginning. We need certain weapon systems to maintain viable military balance, and we need supremacy in science and technology to maintain world leadership.



The 1958 computer subassembly in foreground is functionally comparable to 1955 unit at left and 1950 unit in rear.

Where We Stand in Space

The uses and vehicles of space technology are numerous and challenges right now in engineering exceed those in science

by H. GUYFORD STEVER

WITHOUT doubt, the number one news story of the last year was ballistic rockets and spacecraft. When a Special Committee on Space Technology undertook to determine for the National Aeronautics and Space Administration where more effort was currently most needed, the results were surprising to many of us. A large portion of the foreseeable goals of space technology can be achieved with existing knowledge of scientific principles. The problems now are mostly in engineering.

At least four different aspects of human endeavor have a real interest in the solution of these problems. Scientific research would be one of the principal beneficiaries. Space-flight capability would ensure the performance of a number of experiments that are not possible now.

The surveillance of the earth's atmosphere from a point of vantage in space, for example, certainly can teach much about the world's weather. The sun's radiations and cosmic rays from outer space can be studied without the interference of earth's protective atmosphere. The nature of the plasma, the tenuous electrified gas, which exists between the principal bodies of the solar system, can be determined. Unusual studies can be made, too, in the biology and biochemistry of life, especially on a planet like Mars, where simple forms of life may exist, or the Moon, which biologically may be pure.

Another field of human endeavor affected by space capability, of course, is military. The importance of ballistic missiles becomes clear when one considers the range to which a large nuclear bomb can be accurately delivered, at relatively small cost, by a vehicle in which there is no risk of human life, and whose accuracy, speed, and route of approach make defense extremely difficult, if not practically impossible. Space capability also can help in military reconnaissance.

A third kind of human activity in which there is a clear interest in space capability is exploration and adventure. We look forward now to exploring the planets and their satellites in the solar system in the next few decades. Ours is the first generation to have that capability; the curiosity and sense of adventure which has long been a driving force in man will lead him to explore the solar system now that he can.

Space capability also can improve, by engineering achievement, the daily life of humans. A clearly seen example is in communications. In a very few years we will be able to establish vehicles in space which can be used as relay stations, either active or passive, for direct, line-of-sight communications between any points on the surface of the earth, thus eliminating the need for coaxial cables, either over ground or under

sea, or the numerous ground-based microwave relay stations now in use.

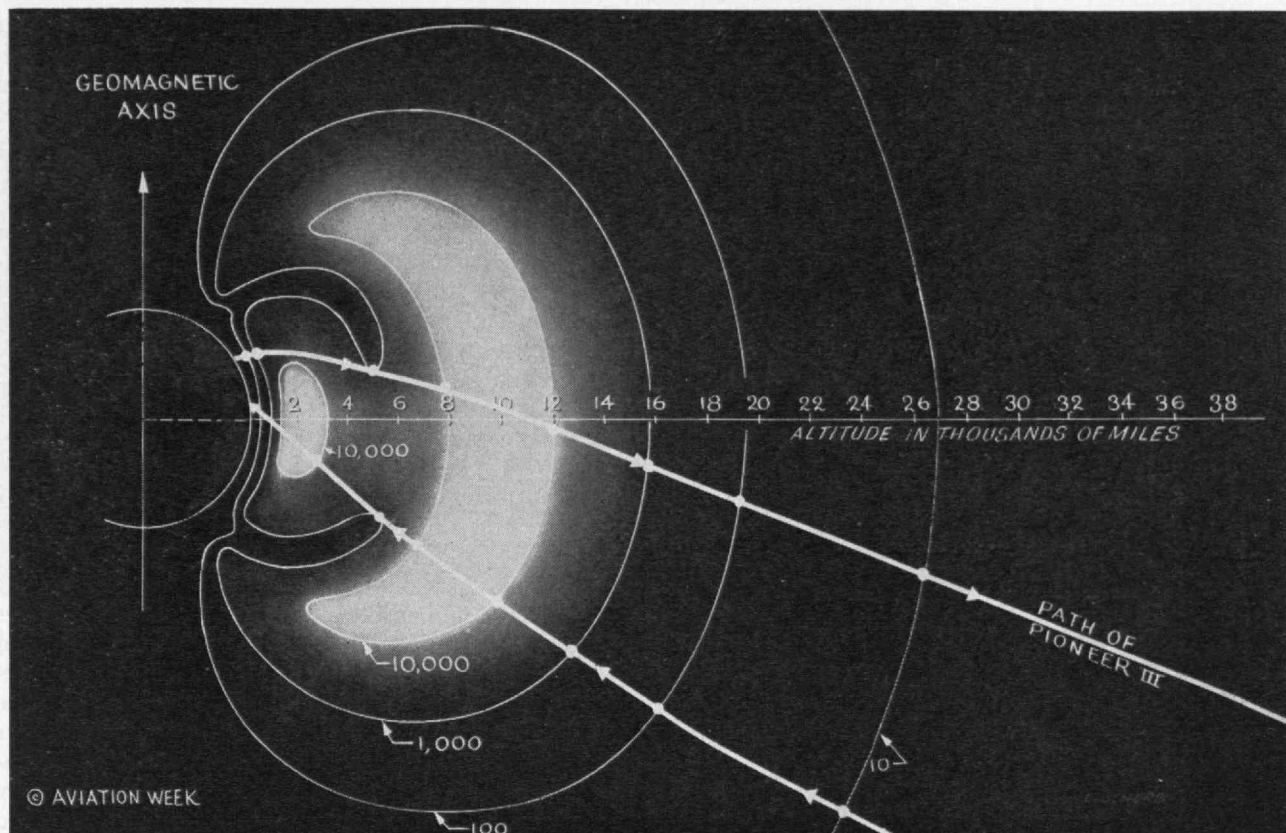
The scientific research and engineering development required to realize these objectives greatly overlap. Many categories and classes of space vehicles can be used for these four different purposes. A long-range ballistic missile can be designed to carry a nuclear warhead a substantial fraction of the distance around the globe with sufficient accuracy to make it a worth-while military weapon. The same vehicle, with the military warhead replaced by scientific equipment, can be used as a scientific probe into the upper atmosphere.

A Variety of Vehicles

A whole spectrum of space vehicles can be conceived between the ballistic missile and the earth satellite. Many of these conceptions are now receiving active study or development. One such device is the boost-glide vehicle which can be used either to explore the technical nature of the upper atmosphere, or as a military weapon to carry a nuclear warhead or reconnaissance apparatus. Such a vehicle is the X-15 which will fly soon. It is designed to be boosted approximately 100 miles in altitude by a rocket engine at speeds up to 3,600 miles per hour. Having reached its high altitude, it will use aerodynamic lifting surfaces to glide at high speed back to earth. The resulting range will be quite large.

A somewhat related type of space vehicle is the semiballistic vehicle. Its speed approaches that of a ballistic missile. Part of its lift comes from the centrifugal force of its curved path through space and part of it comes from aerodynamic forces generated by its lifting surfaces in the rarefied upper atmosphere. Both the boost-glide and the semiballistic vehicle have been proposed as military weapons.

There is yet another "in-between" type vehicle, known as the satelloid or semisatellite, whose path circles the earth just like that of a true satellite. The satelloid, however, is at an altitude somewhat lower than normal satellite altitude, say at 90 miles, where it tends to lose its energy quite quickly because of the drag of the atmosphere. It would naturally spiral back to earth. The satelloid, however, employs a very small rocket motor applying thrust in small bursts from time to time, in order to refurnish it with the kinetic energy required to remain at this "in-between" altitude. This type of vehicle has been proposed for military reconnaissance. Its advantage is that its path is lower and, consequently, optical or other detection means are kept closer to the ground.



Courtesy of Aviation Week

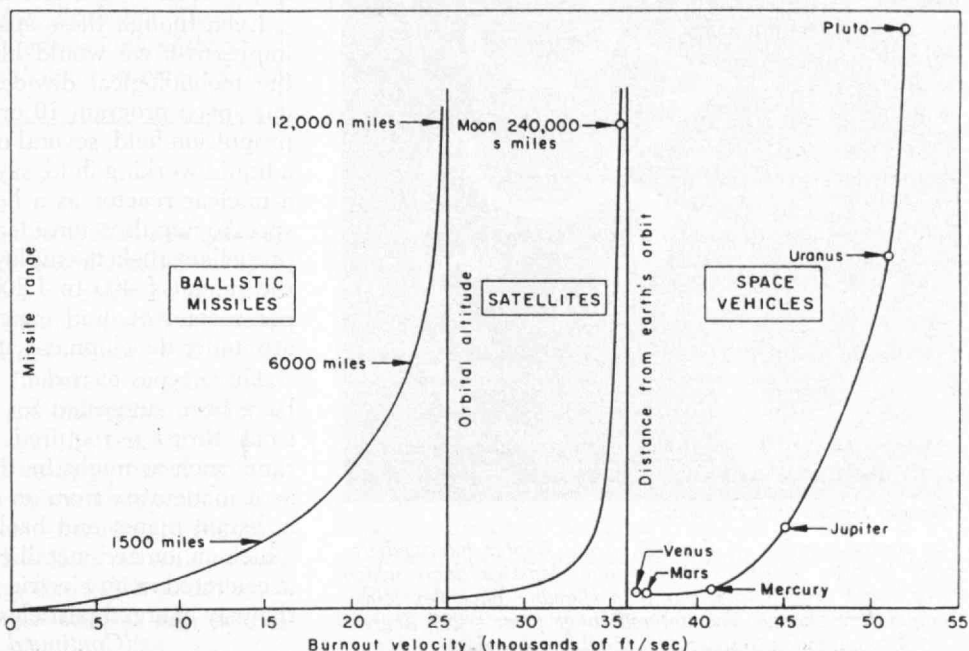
This is an intensity profile of the "Van Allen" radiation around the earth. Two belts of intense radiation have been found at the altitudes indicated from left to right. Number of counts per second registered by Geiger counters in Army Pioneer III space probe is also shown. Relatively low-intensity "horns" which project outward at higher geomagnetic

latitudes may result from atmospheric heating, produced by radiation that leaks in along converging magnetic lines of force, which pushes radiation outward. Peak radiation measured is about 10 roentgens per hour, if it consists of electrons; 100, if protons. Minimum radiation at 6,000 miles is .3 roentgens if electrons, 3 if protons.

Still another type of space vehicle is the satellite of the sun. The successful Russian rocket called the Dream has shown us that this is an interesting mission. One can conceive of vehicles of the same sort, although larger and probably more complicated, becoming satellites of other planets.

Another series of space vehicles of the future will be those which can land on another planet and then, going one step beyond that, those which can both land on and take off from a planet. Finally, in the distant future, there will be true spacecraft which have all the freedom to move wherever mastered by their

This graph shows the velocity requirements at the final burnout time for a number of space missions of current and future interest. It is interesting to note that only a small velocity difference exists between the requirements for extreme-range ballistic missiles and low-altitude satellites, and between those for very high-altitude satellites and Venus and Mars probes.



occupants or controllers on earth. This type of spacecraft, with freedom to navigate about the solar system, is far beyond our present capabilities, but it is one of our dreams.

With four major fields of human endeavor involved in the space effort and about 10 different major types of vehicles, it is clear that the engineering problems are legion.

Propulsion

Propulsion is the key technical field of space flight. Today nearly all our activities are based on large liquid-propellant rocket motors. The solid-propellant rocket motor does not have as high performance potential as the liquid propellant, although its simplicity and reliability have won it a certain place, especially in the upper, smaller stages of space vehicles.

In general, two major characteristics in the performance of a rocket motor determine its quality. One is the specific impulse which determines the amount of propellant that must be burned per unit of time to produce a given force, or thrust. The second is the dead weight of the engine itself, including the tanks, power supplies, and structure involved. The chemical rockets have achieved in design and prac-

tice a reasonably light weight per unit of thrust, but the specific impulse is not too good. Two hundred-fifty pounds thrust per pound per second of fuel burned is a typical characteristic of current rocket engines. Liquid-propellant rockets of the future may have specific impulses of 300 to 350, and solid propellants may run as high as 300.

Because of this relatively low specific impulse of the chemical rocket, compared with the specific impulse of nuclear rockets and more glamorous types of reaction motors, immediate proposals to proceed in research and development of the more advanced type have been made. In the Congressional discussions a year ago which preceded the establishment of the National Aeronautics and Space Administration, there were serious proposals to give the entire space mission to the Atomic Energy Commission because of exaggerated claims that the entire future of space travel depended upon nuclear rockets. But, fortunately, this was not done.

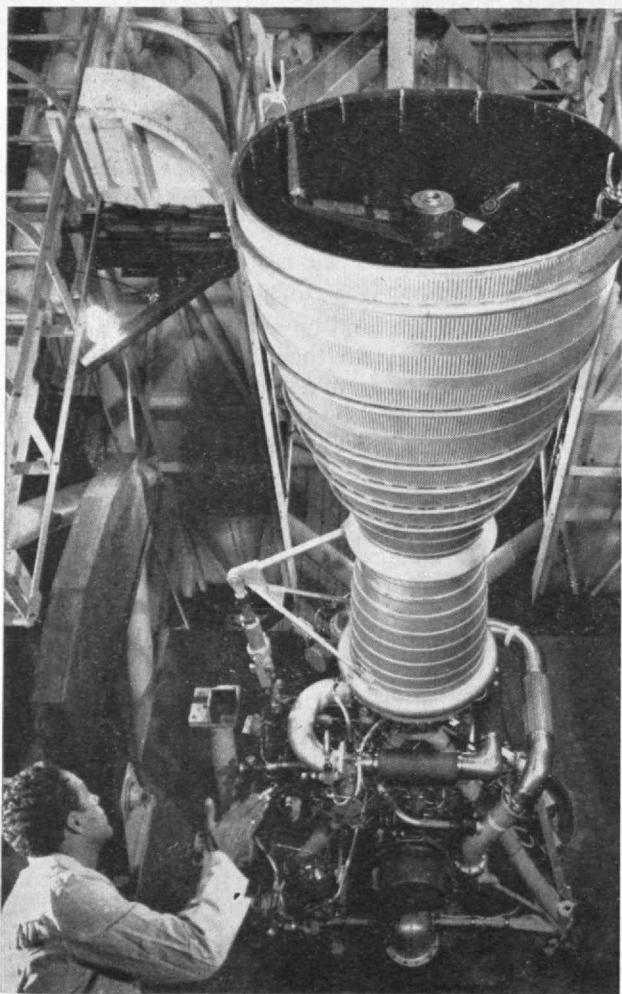
We have immense capability with rocket vehicles either already developed or in advanced stages of development. The Atlas and the Titan could be designed to carry 500 to 2,500 pounds to a 22,400-mile stationary satellite orbit. Such a satellite would hover over a point on the earth because its period of revolution would be 24 hours, corresponding to the daily rotation of the earth. These intercontinental ballistic missiles could also provide a moon impact of 600 to 3,000 pounds, establish a moon satellite of 300 to 1,500 pounds, establish a moon landing of 200 to 1,000 pounds, or go to the region of Venus and Mars with 500 to 2,500 pounds, or to the region of Jupiter with 300 to 1,500 pounds.

Under development currently are rocket engines in the million-pound thrust category. Presumably several years will elapse before these are available. Two approaches are being taken, one in which a number of smaller units are grouped together, and another in which a single-barrel rocket motor of a million-pound thrust is being developed. Rocket vehicles based on such rocket motors can put 25,000 to 50,000 pounds of pay-load weight into a 300-mile satellite orbit.

Even though these space missions would be quite impressive, we would like now to develop some of the technological devices which will be needed in our space program 10 or 15 years from now. In the propulsion field, several offer promise. A rocket using a liquid working fluid, say hydrogen or ammonia, and a nuclear reactor as a heat source offers promise of specific impulses considerably higher than the liquid-propellant rockets employing chemical energy, say in the range of 400 to 1,200 pounds thrust per pound per second of fluid expelled. These nuclear rockets are under development at the present time.

Three types of rockets of still more advanced form have been suggested for use in outer space where a small thrust is required over a very long period of time, such as might be the case in a true space ship as it maneuvers from an earthly satellite orbit out to a distant planet and back. One is the ion engine, in which an ionized metallic substance such as cesium is accelerated in an electric field. This is quite similar to the way charged particles are accelerated in the large

(Continued on page 258)



Allegheny Ludlum Steel Corporation

The thrust chamber of the U.S. Army Jupiter intermediate-range ballistic missile is shown here. Massive ducts which carry liquid oxygen from pump to chamber have flex joints. Temperature changes encountered range from -297 degrees Fahrenheit to several hundred degrees above.



Bradford Washburn

Of 20,000 potential freshmen, 7,000 make inquiry about M.I.T. from the Admissions Office, 4,000 submit final application, 1,800 complete admission requirements, and 900 actually register at the Institute.

The Problems of College Admissions—II

Of the many unsolved problems in selecting students for higher education, those related to emotional factors leading to poor motivation are among the most difficult

by B. ALDEN THRESHER

With potential college enrollment growing more rapidly than educational facilities, the problem of college admissions is troublesome to many students and their parents, as well as to institutions of higher learning. Professor Thresher's timely survey of today's admissions problems of college students is based on a quarter of a

century of first-hand dealing with such problems. In the February issue, Professor Thresher discussed college admissions in general as a complex operation involving students, parents, counseling personnel, and various examining bodies. This month, the emphasis is on factors more directly associated with admissions to M.I.T. — Ed.

EACH year the M.I.T. Admissions Office is in contact with something like 20,000 potential freshmen. This is the number of high school students who either write us a letter, come in to see us, or who talk with an Institute representative in one of our high school visits or with an Educational Counselor in some local area. These 20,000 represent the immediate potential market for freshman admission in the sense that all of these young people have had an opportunity to look at M.I.T. literature, to talk with somebody about the Institute, and to give active consideration to the possibility of whether or not they can or will attend. Out of this number something like 7,000 actually fill out a preliminary application, a costless and simple formality.

To all of these are sent, in turn, the necessary complete final application papers, and about 4,000 submit final applications in detail, take the necessary tests given by the College Entrance Examination Board, and pay a \$10 fee. Our actual selection, therefore, concerns this 4,000 and from them we pick approximately 1,800 to whom we send offers of admission, almost all of these offers going out about the first of May. Of these, in turn, approximately 900 actually turn up and register in September. The attrition of about 50 per cent is due to the fact that all of them apply at several institutions (actually to an average of 3.6 institutions each). Their final choice follows a process of comparison and decision which is often prolonged into the spring months, and de-



M.I.T. Photo

Each year counselors from preparatory schools around the country come to the Institute for a day or two. In addition to meetings in the Kresge Auditorium (shown above), they have opportunities to speak with former students.

pendes very largely on considerations of relative cost, distance, and offers of financial aid.

The process of selecting an entering class at M.I.T. is, for the most part, concentrated in the months from January to May. We normally have, for each applicant, in addition to the usual kinds of data which he himself provides on a six-page application form, personal endorsements written by two teachers who know him well and whom he himself selects. These are sent to us directly without going through the student's hands. We also have a special report form from each secondary school which he has attended, including not only his marks and his rank in class, but the answers to questions about his merits as a school citizen, as a student, and as a person. There is also normally a memorandum made following an interview, either with a member of the Educational Council in some distant center, or here in Cambridge if a student has been able to visit us — or sometimes both. All of this material is held in strict confidence, so that school officials will feel free to speak frankly about applicants.

Upon initial contact with the Institute, freshmen are likely to find M.I.T. a large and labyrinthine group of buildings. The map (shown below), adjacent to the Information Office in the lobby of the Rogers Building, is often consulted.

George W. Brown, '56



It is very important that, as the pressure of applications enables us to be more and more selective, this selectivity should not work itself out solely in terms of test scores or school marks. While we do want students who have high intellectual promise, we know perfectly well that the ultimate peak of high marks is by no means the only consideration. We therefore feel that, as selectivity increases, the broad personal estimate of each applicant should be given an increasing relative weight. Even after we have done this, we find that we are still getting on the average a group which each year shows a higher average performance in high school and on their test scores. While we can safely predict that the Alumni who will do us most credit in future years will be, in the main, those with high intellectual ability, they will not necessarily be those at the very apex of high marks. We feel that the considered judgment of school principals, teachers, and counselors who are adept at judging young people should be given a great deal of weight in predicting probable performance.

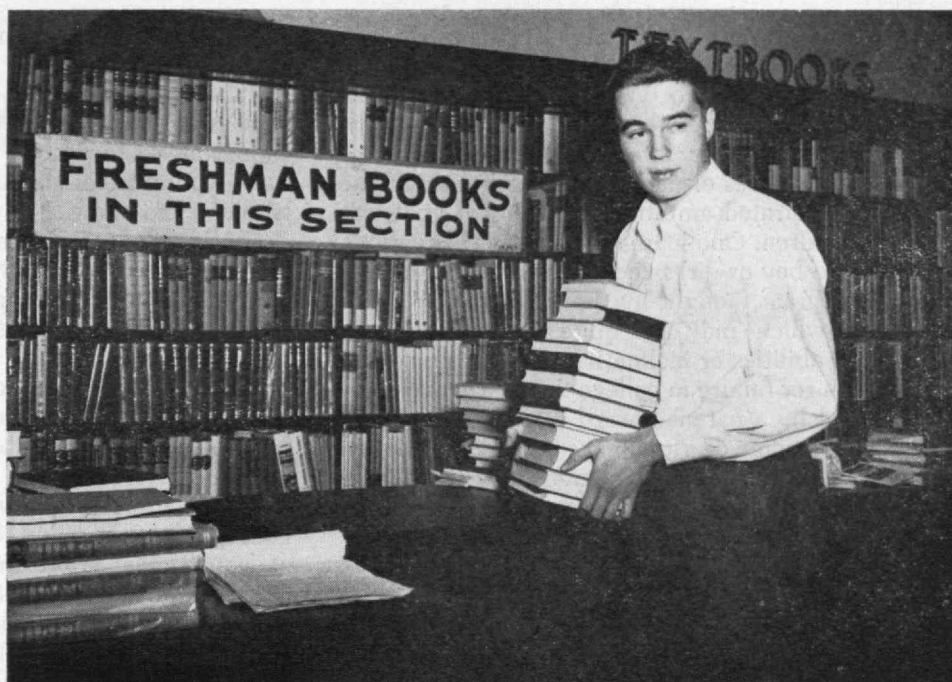
The selection of an entering class involves the appraisal of human excellence in many aspects. Whether a student is admitted depends on an estimate of future behavior and performance, a process necessarily subject to many errors and miscalculations. No one factor, or set of factors, can decide this question, and test scores and statistical devices are only partially effective in giving an answer. Such quantitative data are therefore always subordinate to the indispensable element of personal judgment upon which all decisions about admission must finally depend.

Competition and Comparison

As soon as each candidate's folder becomes complete, it is carefully read and evaluated with reference to the candidate's personal promise based on all the evidence we are able to assemble. In April when scores become available from the March College Board tests, a statistical index is computed, including not only test scores but also school marks and rank in the high school class. This index is retained as a measurement separate from the personal evaluation made earlier. The two are kept separate until the final stage of selection so that we can, for example, see how much we are giving up in academic ability to secure a student of exceptional qualities of leadership, energy, or breadth. Doubtful or borderline cases are read and discussed by several members of the admissions staff.

No question is asked us more frequently by Alumni and by schools than, "Why was this boy refused?" The normal assumption, when this question is asked, is that there is some flaw or defect in the student's record which has disqualified him, and the next step is to ask whether this flaw or defect can in some way be remedied so that he can in turn qualify. It is important, however, to bear in mind that in a system of selective admission the process is not as simple as this. It is not simply a matter of meeting certain fixed requirements and thereby qualifying. Our problem is rather to select a limited number, which is all we can accommodate, and this makes the whole process a competitive and comparative one.

Purchase of textbooks is not a part of the problem of gaining admission to college. But once the admissions problems are solved, the successful candidates quickly become customers of the Harvard Co-operative Society (better known as "The Coop") where texts in physics, chemistry, mathematics, and the humanities outline much of their first year's work at M.I.T.



M.I.T. Photo

We can make no pretense of superior wisdom in our selection process. The one great advantage we have, however, is the opportunity to intercompare all the candidates simultaneously. This cannot be done by the people who write in, often indignantly, about the refusal of a particular candidate. If we refuse a student, therefore, it is not necessarily because there is any flaw in his record or personality, but simply because we have others who, on the whole, and in our best judgment, seem better qualified and who show even greater promise. The queries as to why a candidate was rejected can therefore be answered best by this general principle.

The gradual improvement of our selective processes over a period of years has had a number of interesting results. The most obvious test of the effectiveness of a prediction system in connection with admissions is the degree of correlation between the prediction of performance on the one hand and actual performance of students on the other. What is often not realized is that as selectivity becomes greater, and as we take only a small fraction of students from very near the top of the distribution, this correlation actually decreases. If we were to accept all applicants there would be a very high degree of correlation between predicted performance and actual performance. There would also be a large number of failures. As we confine our admissions to a group very high in the total distribution, random elements play a relatively greater part in the variation so that, in general, the stronger the class the less the correlation with predicted performance.

One might suppose also that as the intellectual abilities of the entering classes become successively better in successive years, as has now been demonstrably the case for some time, we could detect a higher average level of marks, say, in the freshman courses. This, however, seems to be a vain hope. There is no such thing as an absolute standard of undergraduate performance, and the Faculty, perhaps unconsciously, but yet inevitably, tends to push

a class about as hard as it can be pushed. Thus it is very difficult to increase to any great extent the level of grades in individual freshman subjects by improving the quality of the class. Despite this fact it has been possible in the last 20 years, through careful selective processes, to raise the proportion of M.I.T. students who complete the course and graduate from below 60 per cent to about 71 per cent.

People often ask us why we are not able to identify, in advance, a larger number of students who are likely to fail, and to eliminate them from consideration at an early stage. Actually, this is a much more difficult task than appears on the surface. None of these decisions is absolute but represent rather probabilities of future performance. It would indeed be possible to increase somewhat the probability of academic success if we were sufficiently tough in the selective process. This in turn, however, would result in our excluding a great many students who actually would have done well had they entered. To exclude all those who might fail could never be done completely, and if we press too hard in this direction we succeed only at the cost of excluding a great many who would actually do very well. In other words, the selective process represents a statistical estimate. We are dealing always in risks and probabilities, and no candidate is ever a "sure thing." Conversely, none, however unpromising, is completely devoid of hope; some who looked quite undistinguished at entrance, have performed brilliantly.

Danger Signs in Admission

Admissions officers come to recognize characteristic danger signs in applicants. Perhaps the most serious of these dangers is the ambitious parent. Let me hasten to explain, however, what kinds of ambition in parents are dangerous. The parent who wishes his son or daughter to mature gradually into a self-reliant adult who has realized his or her potentialities, is ambitious in the right way. One can have no quarrel

with parental ambition of this kind. The danger lies in the parent who has made an arbitrary choice of what he wants the student to do, or sets arbitrary goals which may have no reference whatever to the student's potentialities or interests. Every admissions officer sees instances of parents who are working out their own frustrated ambitions in terms of goals set for their children. One learns to sense also situations in which the boy or girl is being forced into an educational program thought by the parent to be desirable, but which may be quite unsuited to the youngster's abilities or inclinations. There is no surer prescription for failure in college than excessive pressure exerted by a parent toward a goal which, from the student's point of view, may be arbitrary or inappropriate, even though the parent may think it an admirable one. Often, too, a parent who indignantly denies exerting any pressure on the child can be found to do so, perhaps unconsciously.

A special case of this situation is the choice of college on a purely conventional basis. The mother may decide that her daughter's social standing requires her to enter a particular college, or the choice of a college for a boy may be dictated by a mistaken idea that its "prestige" will somehow rub off on him, thus conferring upon him permanent advantage or a head start for the rest of his life. Probably the best advice that can be given to most such parents is to relax and let their children proceed at their own pace and in

The students shown below are already well into the work of the term. The careful selection process now begins to pay dividends, for relatively few of them will fail in their studies. Most students who drop out do not lack intellectual ability or adequate preparation; their trouble stems rather from emotional problems which result in poor motivation.

M.I.T. Photo



their own way with only a minimum amount of guidance and advice.

There is also the tense, overcompetitive parent who manages to convey this same feeling of tension to the child, and so to destroy the normal joy in learning that a youngster of good intelligence will feel if he is let alone and allowed to proceed at his own pace.

Another danger sign appears in situations where the parent is clearly taking all the initiative and doing all the planning. The admissions officer who glances through a folder and sees a considerable interchange of correspondence with a father or mother and no sign of any communication from the son or daughter is immediately on his guard. The well-advised parent will do everything possible to encourage the child to take initiative and stand on his own feet.

Parents often ask at what stage one should begin getting a student ready to enter college. The answer, of course, is at approximately the age of one year. The parent who brings up the child as a well-adjusted, healthy individual who is interested in the world around him, has had his innate curiosity encouraged and wants to learn, is taking the most important step toward this end. A child brought up in this way is much more likely, by the time he reaches 16, to begin to take the initiative quite naturally in looking around and investigating the possibilities open to him for higher education. He does not have to be "entered" in a college; he enters himself.

Letters of Recommendation

A somewhat related signal of danger is the "heavy build-up." When an admissions officer begins getting letters of recommendation from United States Senators, prominent statesmen, captains of industry, and the like, particularly about a boy who has not as yet communicated with the college at all, he begins to wonder what is wrong. There is an old saying in admissions circles, "The thicker the folder the thicker the student." The ablest of students come in with a minimum of fuss. Such recommendations as they have are likely to come from people who know them well and can speak well of them. One father telephoned a few years ago to ask whether a letter of recommendation from the President of the United States would help in his son's application. It turned out upon inquiry the President did not know the boy. Obviously, then, it would be far better to have a letter from his mathematics teacher or even his basketball coach, if these really knew the boy and could speak intelligently of his performance.

It is often a sign of deep-seated trouble when the parent comes in with criticisms about the school that the boy is attending, or about the boy's teachers. The student who is a good risk for college seldom seems to get into difficulties of this kind. Where there has been friction between the parent and the school it often reflects poor performance which may be due to any one of a number of causes, not least among these being the attitude of the parent himself or the undue pressure which he may place upon the child.

Since it is the responsibility of an admissions officer to make the most careful possible selection of the
(Continued on page 266)

BUSINESS IN MOTION

To our Colleagues in American Business ...

The initials T.A. stand for Technical Advisor. This is not a fancy title for the Revere representatives who call on prospects and customers, but rather one that designates the man having that title as being thoroughly schooled and qualified to aid manufacturers in the proper selection of non-ferrous metals.

To be a Revere Technical Advisor a man must be completely conversant with metallurgy and its application to present-day production. And, if you ask him the type of question that cannot be answered on the spot then he is qualified to present the problem to Revere's Research Laboratories in a manner that will result in a satisfactory answer.

To show you how Revere's Technical Advisory Service can render you valuable aid we cite the following example: Years ago the country's oldest manufacturer of milk coolers came to Revere with the idea of building copper-lined coolers to supplant their galvanized ones which had produced corrosion and other problems.

Revere's Technical Advisory Service worked with them in the designing of a satisfactory product. It took time, plenty of time, and experimentation. But the result was well worth the effort . . . a deoxidized Revere copper for the lining and Revere Copper Tube for the heat exchangers. But Revere's service did not stop there. For in order to keep down costs the manufacturer called on Revere's Technical Advisory Service, from time to time, to help them redesign their

cooler for greater efficiency and economy. Revere Research also showed this manufacturer how to overcome their soldering and welding problems.

Because of the continuing efforts of Revere's Technical Advisory Service, in connection with Revere's Research Laboratories, this manufacturer is today in the position of being able to offer a most efficient cooler at the least possible cost. Claims of this manufacturer for this cooler are that it will cool milk, uni-

formly from top to bottom without mechanical refrigeration and electricity. That the cream on top will never warm up. That the cooler produces continuous 24-hour cream line cooling which removes the heat from the cream line on the top as well as from the milk on the bottom. That temperature of the milk always goes down, never up, between milkings...not one B.T.U. of heat that passes through the side walls or the bottom ever reaches the milk. This is still another example of how Revere's Technical Advisory

Service was able to fit the metal to the job in order to produce a superior product at the least possible cost.

Practically every industry you can name is able to cite similar instances. So we suggest that no matter what your suppliers ship you, it would be a good idea to take them into your confidence and see if you cannot make a better product at lower costs by specifying exactly the *right* materials.



REVERE COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

Executive Offices: 230 Park Avenue, New York 17, N. Y.

TREND OF AFFAIRS

(Continued from page 238)

Of Many Interests

■ Always providing a stimulating program, the meeting of the Alumni Council on January 12 was unusual in the variety of subjects discussed. John J. Wilson, '29, President of the Alumni Association, presided at the dinner at the Faculty Club which was attended by 149 members and guests.

Donald P. Severance, '38, Secretary-Treasurer, reported changes of class affiliation for three Alumni, and that between December 4, 1958, and January 10, 1959, visits to eight M.I.T. clubs (including those of Monterrey, Guatemala, and Panama) had been made by six different members of the M.I.T. staff and officers of the Alumni Association. Also announced was the personnel of the committee for the Alumni Officers' Conference to be held next September, for which F. Leroy Foster, '25, was designated chairman.

Speaking for the Alumni Fund, Edwin D. Ryer, '20, announced that 8,533 Alumni had given a total of \$344,000 to the Fund as of January 9. This is an increase of 12 per cent in number of givers and 46 per cent in amount given over corresponding figures of a year ago.

Mr. Wilson next presented J. A. Stratton, '23, whose election as President of M.I.T. had been announced and become effective since the last meeting of the

Council. The warmth of Dr. Stratton's remarks was matched by the Council's welcome to him.

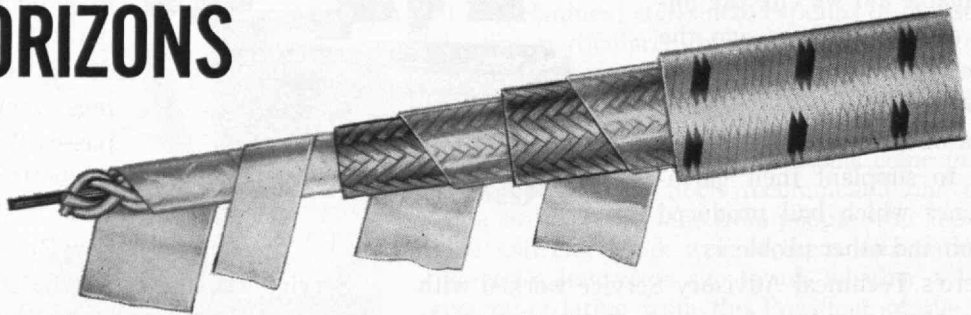
A year ago, the Institute established a new position of Planning Officer, to which Malcolm D. Rivkin, '56, was appointed. In this post, Mr. Rivkin has been assigned the task of advising the Institute's Administration on long-range planning concerning the future physical development of the Institute. He has been asked to relate the academic, research, and administrative needs of the Institute to the development of Cambridge as a whole. In particular, the dense urban character of M.I.T.'s surroundings may have major effects on the character and kind of facilities which the Institute will need in the future. Developments within the city, such as highway construction, urban renewal, and citizen action become of increasing interest.

Mr. Rivkin cited the type of growth of M.I.T. which has accentuated the Institute's need to plan ahead; that is, the volume of government research, the large number of married students, the change to a residential university environment, and the growth which, since 1940, has resulted in twice the number of undergraduate students, three times the number of graduate students, and 110 per cent more Faculty members. Speaking on problems related to automobiles, he compared the cost of a multiple-storied building (for car parking) to the cost of land acquisition in the Cambridge area for possible future use as car-parking lots; presented figures on the traffic flow on Massachusetts Avenue, Memorial Drive, Main

(Continued on page 254)

NEW HORIZONS

IN
LOW CAPACITY
EXTRA FLEXIBLE
COAXIAL CABLES



FOR LOW LEVEL SIGNAL CIRCUITS

These cables are particularly valuable in applications where the impulse is extremely small and where exceptional flexibility is a must. In connection with delicate brain surgery the New England Medical Research Center is presently using one of these coaxial cables. Balantine Laboratories have found that BIW 411 with a capacitance of only 10 mmf per foot is ideal for their VTVM R.F. probes.

Shown above is a typical "F.F." flexi-filamented semi solid type. The insulation uses a filamented construction which imparts a large percentage of air in the cross-section. This cable, BIW COX-4FF-26-DL has a nominal capacitance of 13 mmf per foot and an OD of .175". The coaxial is very stable electrically

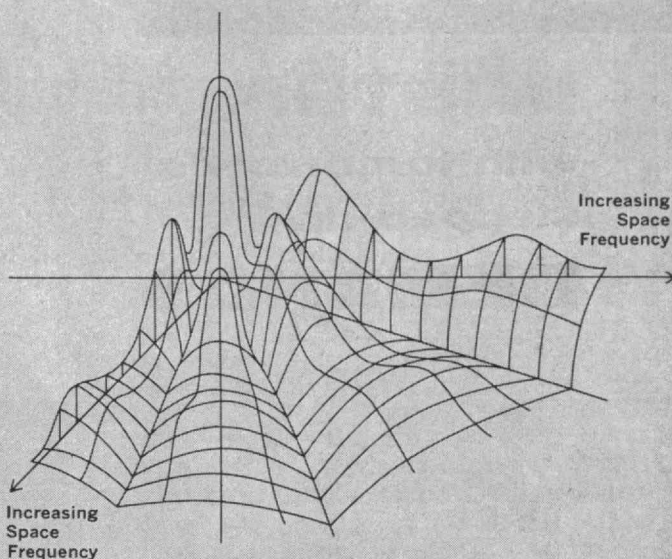
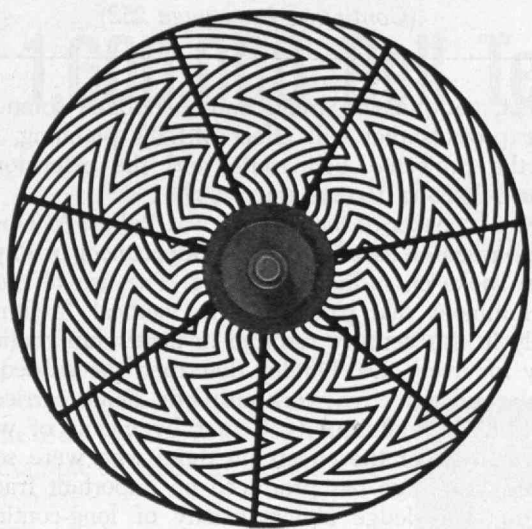
even after flexing and vibration and it has a temperature range of -76°F to $+500^{\circ}\text{F}$. It is used on a Firing Control System.

Other interesting cables are used for sensing circuits in missile nose cones, missile applications and high temperature aircraft — these being COX-3FF-24, COX-4FF-MG and COX-4FF-023-GF. Accepted as standard approved construction for military use is COX-4FF-026-GV RG-210/U.

Capacitance ranges from 7 mmf to 15 mmf per foot.

If your present or planned application calls for low capacity, extra flexible coaxial cables — for low level signal circuits, let us send information.

BOSTON INSULATED WIRE AND CABLE CO., BOSTON 25, MASS.



Phosphor bronze reticle (actual size) and space frequency transfer characteristics of circular aperture reticle.

TARGET DISCRIMINATION IN INFRARED DETECTION SYSTEMS

The pioneering field of infrared detection offers many challenging opportunities to scientists and engineers at Ramo-Wooldridge for advanced studies in the solution of target discrimination problems. Research is continually under way at Ramo-Wooldridge in the integrating of infrared detection devices with the latest electronic systems techniques for enhanced target detection on the ground and in the air.

The phosphor bronze reticle, or image chopper, illustrated above was developed by Ramo-Wooldridge. It indicates a marked stride in space filtering discrimination concepts, and is used for target signal enhancement in guided missiles, anti-aircraft fire control and air collision warning applications.

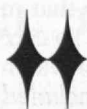
The reticle is used in the focal plane of an infrared optical system and is rotated to chop the target image for the desired space filtering. It is also employed in time filtering, such as pulse length discrimination, or pulse bandwidth filtering.

Space filtering is critical to infrared systems, because of its ability to improve the detection of

objects located in the midst of background interference. In a manner similar to that used in the modification of electronic waveforms by electrical filtering, space filtering enhances the two-dimensional space characteristics of a target. The size and features of the target are highlighted and the undesired background eliminated.

Scientists and engineers with backgrounds in infrared systems—or any of the other important areas of research and development listed below—are invited to inquire about current opportunities at Ramo-Wooldridge.

- Electronic reconnaissance and countermeasures systems
- Analog and digital computers
- Air navigation and traffic control
- Antisubmarine warfare
- Basic research
- Electronic language translation
- Information processing systems
- Advanced radio and wireline communications
- Missile electronics systems



RAMO-WOOLDRIDGE

P.O. BOX 90534 AIRPORT STATION • LOS ANGELES 45, CALIFORNIA

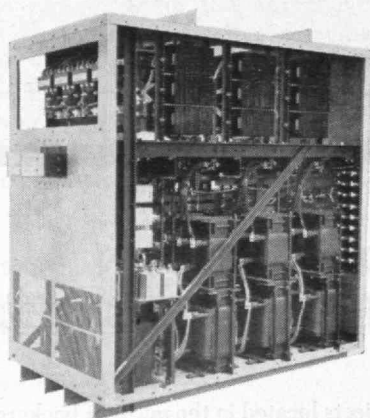
a division of *Thompson Ramo Wooldridge Inc.*

HEVI-DUTY

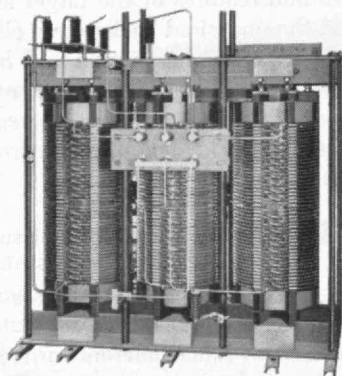
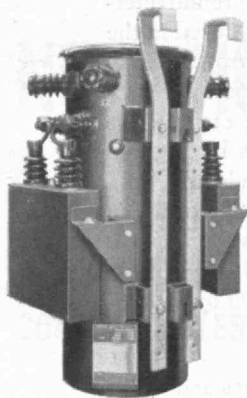
IN STEP with tomorrow's stepped-up DEMANDS

DRY TYPE TRANSFORMERS, CONSTANT CURRENT REGULATORS AND SATURABLE REACTORS

**CONSTANT
CURRENT
REGULATOR**
used in an
industrial
electrochemical
process.



**CONSTANT CURRENT
REGULATOR**
for street, subway and
airport lighting.



DRY TYPE TRANSFORMER,
300 KVA, for unit substation. Other transformers
are available from 5VA to 2000 KVA as well as
Saturable Reactors from 25VA to 500 KVA.

HEVI-DUTY ELECTRIC COMPANY

MILWAUKEE 1, WISCONSIN

Harold E. Koch, '22, President
Elton E. Staples, '26, Vice President
Chester Meyer, '36, Assistant Secretary

TREND OF AFFAIRS

(Continued from page 252)

Street, and Vassar Street; and mentioned some specific projects that will affect M.I.T.'s planning, such as the projected belt route and the extension of Route 2.

Final speaker of the evening was Robert A. Dudley, '51, a research associate in the Department of Physics, who spoke on radium poisoning. The use of radium in luminous dial paints and in medical "treatment" early in this century resulted in death and tragic injury for many. Dr. Dudley described the subsequent study and detective work currently being carried on in M.I.T.'s Radioactivity Center by means of which the analysis of the effects on those who were so exposed years ago has produced an important fraction of our knowledge about toxicity of long-continued irradiation of the human body—a subject of crucial interest as we enter the atomic era. He described how data from this vital "experiment" inadvertently started several decades ago are now being collected and studied at M.I.T. He also described many of the problems in connection with this work such as finding the persons who had received these internal doses of radium decades ago; finding ways of measuring the amount of radium in the body and extrapolating to an estimate of the original radium burden which had existed initially; determining the distribution of the radium in the body; and determining the medical effects, such as damage to blood-forming organs, malignant tumors, pathological fractures, and bone destruction.

Twenty-five Years Ago This Month . . .

■ During March, 1934, inhabitants of southern Illinois and Indiana recovered 28 of a total of 40 small red rubber balloons which had been released on February 28—"a cold, still day"—by members of the Institute's Division of Meteorology from Lambert Field Airport, St. Louis, Mo.

Directing the launching had been Professor Carl G. A. Rossby, and the balloons, each about four feet in diameter when inflated, and carrying delicate recording instruments in shock-absorbing bamboo frames, had been released in accordance with careful weather forecasts prepared at Technology by Professor Hurd C. Willett and Jacob Bjerknes, the distinguished Norwegian meteorologist of "polar front" authority.

In The Review's words, "These travelers to the stratosphere rose many miles above the earth, and finally burst in the rarefied air of that region. The fluttering fragments of broken rubber were relied on to break the instruments' speed of descent. Each bore an identification tag offering a reward to the finder, providing the instruments and their records were not tampered with. . . .

"A mid-continent location for the experiments was chosen in the hope that most of the instruments would be found on land. To carry out the study in New England, where the prevailing winds are from the west,

(Concluded on page 256)

1,600,000 Bell Telephone Share Owners

Most are small share owners. Women are the largest group.

More than 250,000 are Bell telephone employees.

The Bell System is an outstanding example of American democracy in business.

Millions of people use telephone service. 735,000 people work for the Bell companies. More than 1,600,000 people own A.T.&T. stock.

The owners of American Telephone and Telegraph Company stock are people in all walks of life.

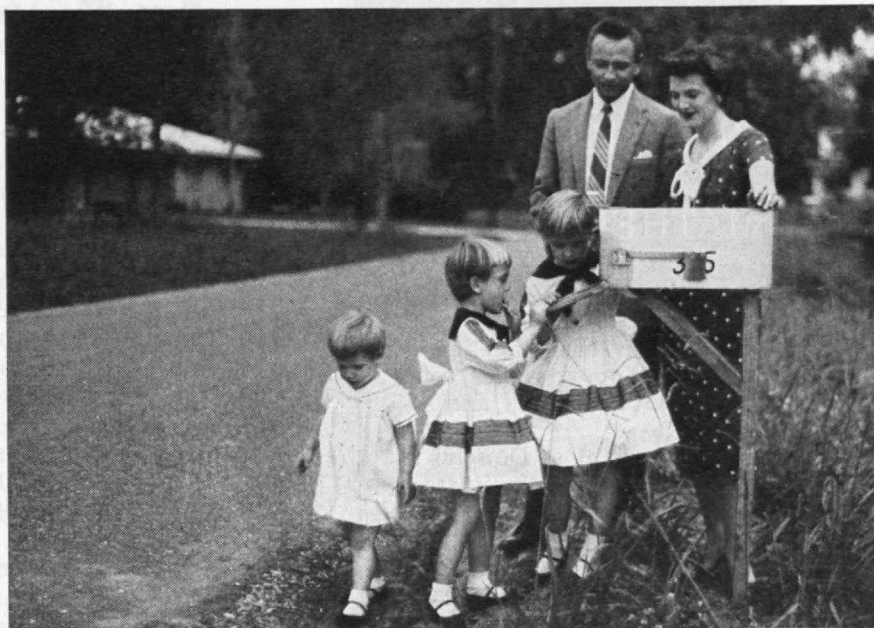
Most of them are small share owners. No one individual owns as much as 1/30th of one per cent of the stock. Many thousands own five and ten shares. About half own fifteen shares or less.

Women are the largest group and hold the most stock. Over 250,000 of the share owners are Bell telephone employees.

Some 85 per cent of all the shares are owned by individuals. In addition to these direct owners of A.T.&T. securities, many millions of other people have an important, beneficial interest through the holdings of their insurance companies, pension funds, investment companies, unions, savings banks, etc.

The total of direct and indirect owners represents the great majority of all the families in the country.

A.T.&T. share owners, and the owners of A.T.&T. bonds, are the financial foundation of our ability to serve. For without the money they have put in the business you



OWNERSHIP IS WIDESPREAD. A.T.&T. share owners live in cities, towns and on farms, in 22,000 communities throughout the country. About 450,000 of the shares are in two names, generally husband and wife. Many hundreds of hospitals, churches, libraries and charitable organizations are among the holders of A.T.&T. stock and bonds.

would not have the quality and quantity of telephone service you enjoy today. Nor would there be work and wages for 735,000 employees.

Obviously, investors will continue to supply capital in the amounts required for present and future needs only if they can expect the Bell System to earn a return on the money they invest that is reasonable in comparison with the earnings rates of other companies and industries.

So telephone progress, and the advantage to all that comes from push-

ing ahead, begins with good earnings and our faith that Americans want good and improving service at prices which allow a fair profit.

That is the way of life which in our country has stimulated invention, nourished enterprise, created jobs, raised living standards and built our national strength.

As long as we live by this principle—and earnings are sufficient to enable us to carry it out—the future of the telephone is almost limitless in possibilities for service to you.

BELL TELEPHONE SYSTEM



ENGINEERS PHYSICISTS MATHEMATICIANS

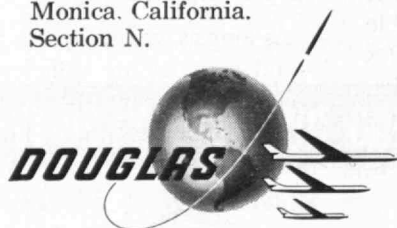
Douglas diversification affords broadened opportunities, combined with stability and security.

Engineering at Douglas is divided into three basic areas . . . missile and space systems, transport aircraft and combat aircraft. In these military and commercial categories, each advancing beyond present frontiers of achievement, engineers and scientists can progress to the limit of their capabilities.

In addition, supervisory and executive openings are filled from within the company. Many of the top executive officers at Douglas are engineers who have moved right up to assume wide responsibility.

We are interested in engineers with backgrounds in other fields as well as avionics, aircraft and missiles.

For further information write to Mr. C. C. LaVene, Douglas Aircraft Company, Inc., Santa Monica, California. Section N.



the most respected name in aircraft,
missile and space technology

TREND OF AFFAIRS

(Concluded from page 254)

probably would have resulted in loss of most of the balloons at sea."

Preliminary readings of the first meteorograph received back at the Institute indicated that the balloon had risen to a height of 10.7 miles, where the temperature was recorded as -64 degrees Fahrenheit.

■ It was announced in The Review that Professor Jerome C. Hunsaker, '12, Head of the Department of Mechanical Engineering, had had honorary fellowship conferred upon him by the Institute of the Aeronautical Sciences. He was at the time retiring from the presidency of that Institute, the incoming officers of which included Donald W. Douglas, '14, as Vice-president, Edwin E. Aldrin, '17, as Treasurer, and Lester D. Gardner, '98, as Secretary.

■ Kudos came also to other Alumni in the form of new responsibilities, namely: . . . to Francis P. Sears, '90, as President of the Columbian National Life Insurance Company; . . . to Elbridge C. Jacobs, '96, as State Geologist of Vermont; . . . to Arthur C. Willard, '04, as President of the University of Illinois; . . . to Alfred H. Schoellkopf, '15, as President of the Niagara Hudson Power Corporation; . . . to Lamot du Pont, '01, and Frank B. Jewett, '03, as newly elected Life Members of the Institute's Corporation.

Space Environment Symposium

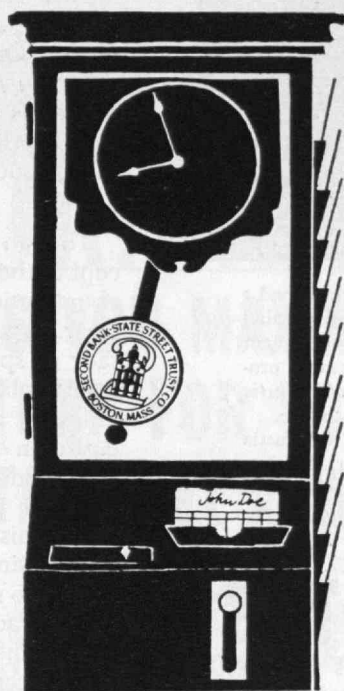
■ Now that the Institute's Department of Aeronautical Engineering has become the Department of Aeronautics and Astronautics, courses are being revised and people are being reoriented toward education and research regarding space. As part of this program, a Space Environment Symposium got under way in February and will continue through the spring.

Lecturers in this symposium in March will be Gerard de Vaucouleurs and Fred Whipple of Harvard and Professor Millett G. Morgan of the Thayer School of Engineering at Dartmouth. In April, Professor Robert Leighton of the California Institute of Technology, Professor Clyde Tombaugh of New Mexico A. and M. College, and Richard Herzog and Murray Zelikoff of the Geophysics Corporation of America will be heard. Professor Harold C. Urey of the University of California and Herbert Friedman of the Naval Research Laboratory will conclude the series in May.

Mid-Year Degrees

■ Diplomas have been awarded to 235 students at mid-year by M.I.T. The students represent 33 states and 23 foreign countries. The largest number of foreign students to receive diplomas came from India, and the largest number of graduates from the United States were those from Massachusetts.

There were 180 graduate degrees awarded and 48 undergraduate, with seven students receiving both bachelors' and masters' degrees.



HOW BIG CAN A SMALL BUSINESS GROW?

Yesterday a one-man business; today a thriving, growing organization; tomorrow . . .? There seems to be no limit to the future of the alert, small businessman. Sometimes, though, ability and determination are not enough. Sound financial planning must precede larger plant facilities, new equipment, bigger inventories. If your business has reached a crossroad where the high road to growth requires experienced financial advice,

you're welcome at Second Bank-State Street. These officers in our Credit and Loan Division are ready to go to work for you:

ALFRED S. WOODWORTH, *Senior Vice President*
Vice Presidents

N. PRESTON BREED
CLEMENT W. DEASY
WALTER E. DOW, JR.

FRED D. HARRINGTON
A. MORRIS HUGHES
R. FORBES PERKINS

*Whatever your banking or trust needs,
you're welcome at*

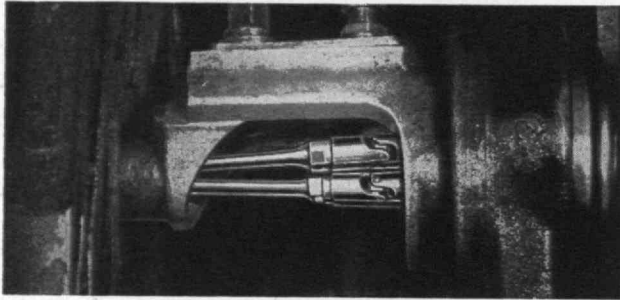
SECOND BANK - STATE STREET
Trust Company



HEAD OFFICE:
111 Franklin Street
Richmond 2-4500
Boston, Mass.

Member Federal Reserve System • Member Federal Deposit Insurance Corporation

Solving a breakage problem AT CLOSE QUARTERS



The manufacturer of this button-drilling machine had a tough problem: the universal joints on these parallel shafts carried such a torque load there were frequent complaints of breakage . . . yet the close centers prohibited use of a larger joint. **The solution** was a Curtis Universal Joint of the same size but higher torque.

This is only one of many problems solved by Curtis Joints — size for size the strongest universal joints designed for industry. Selected materials, precision engineering, and over 30 years' experience manufacturing universal joints make them that way.

14 SIZES ALWAYS IN STOCK
3/8" to 4" O.D.
(6" joints on special order)

Not sold through distributors. Write direct for free engineering data and price list.

TRADE
© **CURTIS**
MARK
UNIVERSAL JOINT CO., INC.
8 Birnie Avenue, Springfield, Mass.
As near to you as your telephone

EXCLUSIVELY A MANUFACTURER OF UNIVERSAL JOINTS SINCE 1919

SANGAMO ELECTRIC COMPANY offers you a rewarding career

Sangamo Electric Company is one of the leading manufacturers in the fields of electrical measuring and control equipment, electronic components and military products. Sangamo's constant progress reflects the importance that Sangamo personnel place on the development, manufacturing and marketing of high quality products. These include electric meters, power capacitors, time switches, dynamotors, generators, electronic capacitors, recording instruments and military items. Besides the main plant in Springfield, others are situated at Marion, Illinois, Pickens, South Carolina, and in Canada, England and Scotland.

SANGAMO IS A GOOD PLACE TO WORK

Find out about your *opportunity* . . . ask your College Placement Officer, or write directly to Sangamo's Training Director.

These MIT men now hold key positions with Sangamo:

Edward A. Leach, Class of 1927
Vice-President in Charge of Engineering

Ray Ide, Class of 1930
Chief Chemist, Pickens Division

Herbert Johnson, Class of 1943
Chief Engineer

SANGAMO ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS, U.S.A.

WHERE WE STAND IN SPACE (Continued from page 246)

accelerators of nuclear physics. These accelerated particles will give a reaction thrust. One also can use nuclear fusion to develop high-temperature, charged plasmas which in turn are accelerated by electronic means. One can also employ light particles themselves in a reaction motor. Unfortunately, all these proposals are at a very early stage. A long-term research program is required before one can say anything about their future.

Guidance

Though most people today have a fairly good concept of the performance of rocket vehicles, their ideas about guidance of these vehicles in space are not clear. A good reference point for the guidance accuracy of space vehicles is the accuracy obtainable in firing ballistic missiles. At a range of 5,500 nautical miles, or about one-quarter of the way around the earth, an error of one foot per second in the velocity at the end of burning of the final rocket will cause an error in hitting a target of about one nautical mile. This represents an error of about one part in 24,000, since missiles require about 24,000 feet per second to reach that range. One can suspect that such an accuracy is the objective of military ballistic missiles, if they are to be militarily useful. One can also suspect that, in the early stages of development, that accuracy has not yet been fully attained.

What does such an accuracy represent with respect to some of the simpler nonmilitary space missions? In establishing a satellite at an altitude of 1,500 miles, an error of one foot per second in the orbital velocity will cause the orbit to depart from circularity by about one mile. That same accuracy of one foot per second in final velocity would cause a miss of something less than 100 miles in shooting at the moon; in shooting at Mars or Venus, the order of 20,000 to 25,000 miles; in shooting at Jupiter, the order of 65,000 nautical miles. Thus for these one-shot type of space missions, the accuracy of guidance obtainable in ballistic missiles' guidance systems gives us a good space-guidance capability.

The guidance of most of the space missions that one now deals with is initial guidance; the guidance apparatus works only during the first portion of the flight. The equipment used is either of the inertial type or of the radio type. Inertial guidance involves accelerometers and gyroscopes to calculate the deviation from a preset course and to adjust the direction of the thrust to correct for the deviation. Radio guidance employs radar or radio triangulation and Doppler equipment to measure the path of the vehicle. A radio command signal corrects errors which develop in the flight path. With regard to these equipments, the developments already under way for the ballistic missile field clearly assist in the space mission field.

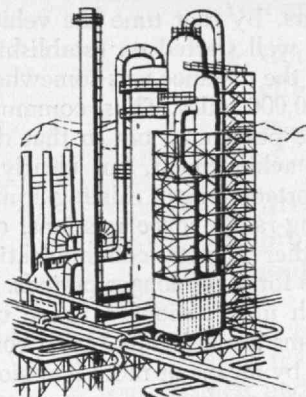
In the future, however, guidance will be required which can be used in the mid-course of the flight of a space vehicle. Star trackers, radio or radar equipment to measure the direction to planets, extremely accurate atomic clocks, additional inertial elements, and horizon-scanning devices will be needed.

(Continued on page 260)

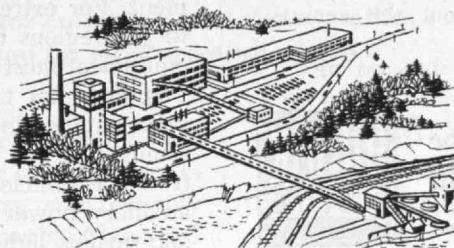
*Over 50 years of world-wide experience
on over 800 major installations
for the process industries*

LUMMUS

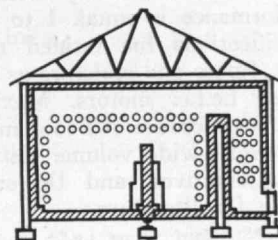
GIVES YOU MAXIMUM RETURN FOR YOUR CAPITAL INVESTMENT!



Petroleum Refineries



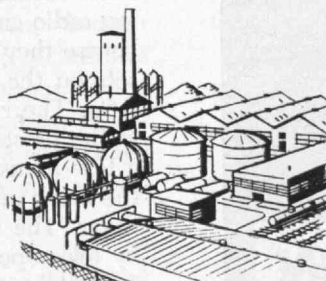
Pulp and Paper Mills



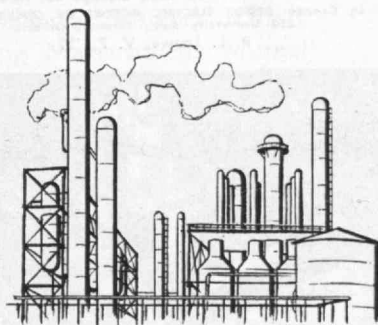
Oil Heaters
(Oil Heater Division)



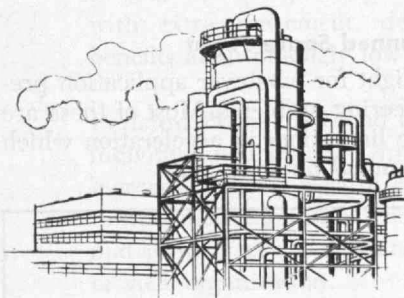
Economic Study and Consulting Services



Agricultural Chemical Plants



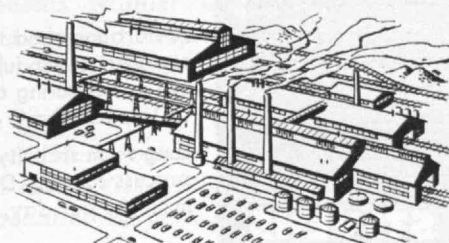
Petrochemical Plants



Chemical Plants



Pilot Plant Work
(Engineering Development Center)



Metallurgical Plants

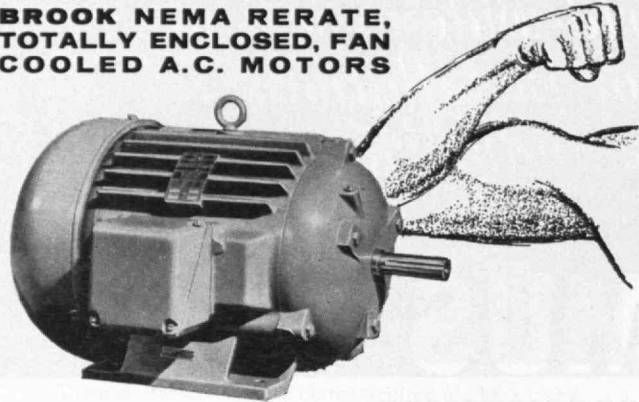


ENGINEERS AND CONSTRUCTORS FOR INDUSTRY THROUGHOUT THE WORLD
385 MADISON AVENUE, NEW YORK 17, N. Y.

HOUSTON • WASHINGTON, D. C. • MONTREAL • LONDON • PARIS • THE HAGUE • MARACAIBO

ALL MUSCLE — NO FAT!

**BROOK NEMA RERATE,
TOTALLY ENCLOSED, FAN
COOLED A.C. MOTORS**



Take less space, weigh less, smaller frames than the Brook standard totally enclosed fan cooled motors—yet, performance is equal. 1 to 40 HP*. Built to N.E.M.A. specifications for rerated motors. Same resistance to dust, fumes and moisture as the larger, heavier, standard frame t.e.f.c. motors. Maximum economy and lower first cost because of Brook modern production techniques and world-wide volume distribution. Warehouses, Sales Representatives, and Dealers throughout the country. Write for literature.

*Standard frame t.e.f.c. motors available 1 to 600 HP.

world's most respected motor
BROOK MOTOR CORPORATION

3553 W. Peterson Ave., Chicago 45, Illinois
In Canada: BROOK ELECTRIC MOTORS OF CANADA, LTD.
250 University Ave., Toronto, Ontario
P. L. Loewe, V. P. '31




**NEW
VIBRATING
CAPACITOR**

A vibrating-reed type capacitance modulator for use in measuring currents as low as 10^{-16} amperes.

Long term stability for process control. Drift ± 0.2 millivolts per day, non-cum.

Write for Catalog 523.

**STEVENS
INCORPORATED
ARNOLD**

7 ELKINS STREET
SOUTH BOSTON 27, MASS.



12-1/4

SEE US AT THE I.R.E. SHOW—BOOTH 2934

WHERE WE STAND IN SPACE

(Continued from page 258)

Finally, there is the terminal guidance problem. We have not developed terminal guidance equipment for either ballistic missiles or true spacecraft. For the most part, we have been content to depend upon the stability of the re-entry vehicle to insure that it does not deviate too much from its initial course as it enters the atmosphere. Some day, terminal guidance must be developed for more complicated missions.

Communication, Tracking, and Observation

When the Russian artificial asteroid was established in orbit around the sun, the tracking was done by radio-direction finding, using the radio transmissions from the vehicle itself. These transmissions continued for 60 to 70 hours. By that time the vehicle was past the moon and well started on establishing its orbit around the sun; the distance was somewhere between 300,000 and 400,000 miles. Thus, communication and tracking were performed out to that distance. That is quite an achievement, but clearly it indicates some of the shortcomings of existing equipment. For extremely long-range space missions, out to the regions of the other planets, communication equipment must continue for much longer periods.

It does not take much imagination to figure out what engineering problems are associated with communication and tracking by means of radio emissions from the vehicle itself. Longer-life batteries or better auxiliary power sources, more reliable components, and smaller, lighter-weight components are needed.

Can the vehicles also be observed and tracked by other means than by radio-direction finders employing radio emissions from the vehicles themselves? Of course they can, if they are not too far away. Radar sets on the surface of the earth can track inert objects. The range at which this can be accomplished at the present time, however, is only of the order of a few thousand miles. So, only the vehicles close to the earth are susceptible to tracking observation by radar. The same can be said for visual observation by telescopes unless there is on the space vehicle an accurately pointed mirror to reflect sunlight back to the telescope.

Manned Space Flight

Manned space flight for whatever application presents unique engineering problems. Most of these are associated with the limitations in acceleration which

(Continued on page 262)

William H. Coburn & Co.

INVESTMENT COUNSEL

68 Devonshire Street

Boston

If you are an executive with a "Corporation Mind"...

You are deeply concerned with . . .

- ★ Getting and holding key men to assure efficient management and sound growth for your business
- ★ Protecting stockholders and their families against loss resulting from the death of an executive-owner
- ★ Arranging the best possible plan to provide emergency protection for employees and their families . . . and a pension for employees who retire.

THESE problems reach to the very foundation of your business and call for important long-range decisions. In these areas, you probably feel the need to talk with a specialist who can add to your own knowledge and help you arrive at the *right* decisions.

Your Massachusetts Mutual man, through his experience and understanding of business life insurance and group coverages, has helped many executives in these complex areas of decision. He can help you, too, with a wide range of Massachusetts Mutual Business and Group Insurance plans. For example:

Executive Compensation Plans: Designed to help you get and *keep* management men — with extra retirement, death and disability benefits at surprisingly low cost.

Pension Plans: A broad range of plans, both individual policies and Group, available in this increasingly vital area of employee benefits — to help meet the retirement needs of executives and key men as well as "rank and file" members of your organization.

Group Plans: Life, Accident and Sickness and Major Medical, readily tailored to meet the special needs of your company . . . to give employees essential financial assistance in times of need. Outstanding Massachusetts Mutual plans for these basic benefits are available to firms with as few as 10 employees.

Business Continuation Plans:

Buy and Sell Agreements funded by Massachusetts Mutual life insurance, to keep a partnership or closely held corporation in business after the death of a partner or stockholder-executive . . . and to provide for the family of the deceased.

Partial Stock Redemption plans funded by Massachusetts Mutual life insurance, to save a family-held corporation for the family at the death of the majority stockholder.

Ask a Massachusetts Mutual man for full information on these plans, or call our General Agent listed under Massachusetts Mutual in your phone book.

Massachusetts Mutual
LIFE INSURANCE COMPANY

ORGANIZED 1851 SPRINGFIELD, MASSACHUSETTS

SPACE TECHNOLOGY

During the past year members of our staff have published a number of significant papers in the following fields:

Electrodynamics
Nuclear Physics
Thermo-Nuclear Power
Magnetohydrodynamics
Solid State Physics
Communication Theory

A brochure listing these reprints may be obtained by directing your inquiries to Dr. Charles T. Morrow.

Space Technology Laboratories' role in the fields of Ballistic Missiles and Space Vehicles provides a medium through which scientists and engineers are able to direct their interests and abilities toward the solution of complex space age problems.

Inquiries regarding staff openings are invited. Write to Mr. James Benning.

*Space
Technology
Laboratories, Inc.*
P.O. Box 95001,
Los Angeles 45, California

WHERE WE STAND IN SPACE

(Continued from page 260)

a man can withstand, and the environment which a man must have to maintain life.

The first of these engineering problems is a characteristic of rocket takeoff. The large spacecraft now conceived employ liquid-propellant rockets for the principal booster stages. Experience indicates that these are somewhat unreliable. There is a high percentage of failures at or near takeoff. Thus, the first safety problem is to ensure a method of survival even if an accident occurs during the boost period. The current plan to ensure greater safety for a manned capsule at takeoff is to employ a reliable solid-propellant rocket as an auxiliary safety rocket. Such a rocket, in event of failure of the main booster, can propel the manned capsule sufficiently high in the air so that the parachute and other escape mechanisms can be activated.

Failures of liquid-propellant rockets are not usually explosive; rather, there is only a fire of rapid build-up. There is little danger of shattering the manned capsule with an abrupt explosion of a liquid-propellant rocket. In the future, when and if large solid propellants are used as the initial booster stages, though the chance of failure will be less than for liquid-propellant motors, there will be a greater danger that a true explosion will occur. This characteristic of solid-propellant rockets may rule them out as boosters for manned space vehicles. Experience has shown, however, that they are more reliable and simpler to operate than liquid-propellant rockets.

The accelerations encountered by the vehicle during the burning period must be kept within the limits which a man can stand. Many experiments now indicate that a man can stand about 10 g. acceleration for the length of time of the boosting phase, say of the order of one minute. This is just about the peak acceleration achieved in a multistage rocket. The acceleration of the manned capsule builds up from a small value at takeoff, slightly over 1 g., to fairly large values at the end of the burning of a given stage, because, though the thrust of the rocket stays constant, the mass of the vehicle drops with the rapid burning of fuel. In a staged vehicle the final acceleration stays within tolerable limits.

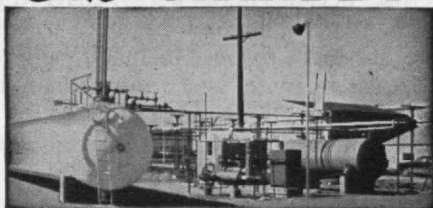
Analysis of the decelerations to which a vehicle is subjected as it re-enters the earth's atmosphere indicates, however, that the accelerations will far exceed
(Concluded on page 264)

VAGABOND RANCH

Granby, Colorado. Designed especially for boys 12-17 who have "outgrown camp." Ranch life spiced with travel. "Wagons West" caravan for eastern boys. Riding, pack and Jeep trips, fishing, shooting, climbing, prospecting, own ghost town. Camping trips all over West. R.N., geologists, mature staff. 13th season. Separate travel program for girls 14-18. Folder:

Mr. & Mrs. C. A. Pavsek
Rumsey Hall School
Washington, Conn.

GAS STANDBY



Packaged 12 mcfh plant designed and built by Draketown for...

- ★ Utility or Industrial standby
- ★ Peak shaving and augmentation
- ★ 100% Town or plant supply

A Packaged Draketown Propane Plant will help you reduce demand charges; provide a supply of gas during curtailment periods... at the turn of a valve... or supply that outlying section or plant 100% if desired.



PROPANE PLANTS

"Good Gas Insurance"

If you have a gas problem, we can help you. We operate from coast to coast and overseas.

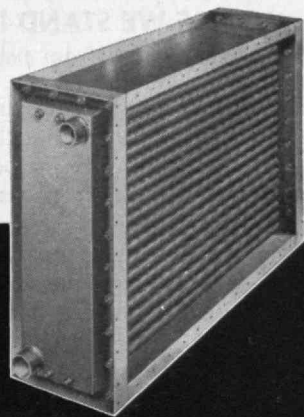
Phone or write today—no obligation.

DRAKE & TOWNSEND

INCORPORATED

Consulting • Design • Engineering • Construction

11 WEST 42ND STREET • NEW YORK 36, N. Y.



MAXIMUM
Heat-Transfer Capacity
in Limited Space

LOW AIRWAY RESISTANCE

AEROFIN Smooth-Fin
Heat Exchangers

AEROFIN CORPORATION
101 Greenway Ave., Syracuse 3, N. Y.

ACCURATE TEMPERATURE READINGS

WHEREVER AND
WHENEVER WITH

Veri-tell
PORTABLE
PYROMETERS BY WEST



These rugged, handy precision-built instruments are widely used for taking spot readings where permanent installations are needless and for checking other instruments. Each mounts a Veri-Tell high resistance pyrometer in a gasketed aluminum housing, itself contained in practical Oak Case with lock and handle. Quick, positive service is assured by binding posts for attaching thermocouple. Automatic meter shunt protects meter when case is closed. Fully guaranteed and surprisingly low priced. Write for Catalog IE-1.

Many standard and special thermocouple assemblies including hand probes are available to permit reading—

- Surface temperature of dies, etc.
- Temperature of non-ferrous molten metal
- Immersion temperature of hot oil, wax, solder pots, etc.

ASK YOUR DEALER

WEST Instrument
CORPORATION
CHICAGO
SALES OFFICES IN PRINCIPAL CITIES

4355C W. Montrose Ave.

Chicago 41, Illinois

William C. West ('11) Chmn.

Canadian Representatives:

Upton, Bradeen & James

English Plant: West Instrument, Ltd.

52 Regent St.

Brighton 1, Sussex

WHERE WE STAND IN SPACE

(Concluded from page 262)

those which a man can stand unless the re-entry is made at a very low angle from the horizontal. Other engineering problems are introduced by such re-entry trajectories. As one can easily see, such a low-angle re-entry trajectory through the atmosphere is a very long one; many thousands of miles are traversed through the atmosphere. This makes landing and recovery at a specific point a much more difficult job to accomplish.

Another problem of manned re-entry into the earth's atmosphere is associated with the great heating rate of a high-speed re-entry. This problem was met first, of course, in ballistic missile design. Now a number of techniques have been developed to permit re-entry of vehicles through the earth's atmosphere at these very high speeds without having them burn up. One is to employ a thick shielding skin to absorb much of the heat. Another is to use a material on the skin which slowly dissociates and evaporates, using the latent heat of vaporization in absorbing large amounts of heat. In the future, no doubt, these and other techniques will solve the heating problem.

Radiation constitutes another much talked-about hazard to manned space flight. A great deal more study is needed to understand the full biological implication of a heavier cosmic-ray dosage.

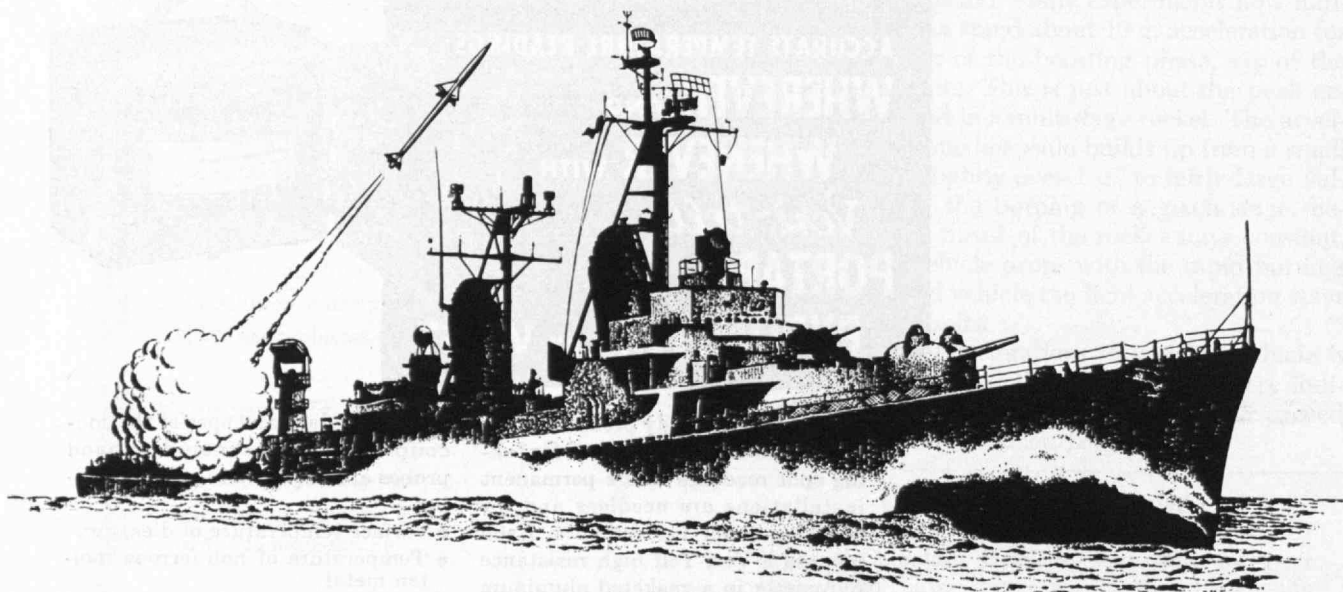
Recently in satellite experiments, new space radiations were discovered which consisted of high-energy particles, either electrons or protons, which had estab-

lished stable orbits around the earth. This radiation, known as Van Allen radiation (as shown on page 245), can be serious because high-energy, charged particles create soft x-rays when they impinge on the space vehicle. There seem to be two major belts of high-intensity radiation, with lesser intensity in between, concentrated around the equatorial plane.

If this radiation proves to be sufficient in intensity and character to be damaging to humans, it will be possible to avoid it by the selection of proper paths, avoiding the high-intensity belts. Long-range space missions can go out on a polar route, though such routes are more difficult than an equatorial route from the standpoint of propulsion. Shorter-range manned missions, such as satellite missions, can be arranged so that the trajectory stays below the first of these two radiation belts.

There are, of course, many other problems with respect to proper living conditions, food, and so on, on manned space flight for extremely long missions. By the time we have the capability of getting a man out into space and back through the atmosphere safely, however, we will have had plenty of opportunity to work on these environmental problems.

We can accomplish many of the desired space missions soon, simply by employing our known rocket, guidance, tracking, and vehicle-design capabilities. But if we are to have a long-term space program, one which involves more and more complex missions, with bigger vehicles going to more remote objectives, we will need new developments which are only in the idea stage today.



BATH IRON WORKS

Shipbuilders & Engineers

BATH, MAINE

Builders of Guided Missile Destroyers For the United States Navy



NEW HORIZONS *at the New England Trust*

This is the new front entrance to The New England Trust Company, at the corner of Milk and Devonshire Streets. Inside there are other extensive changes, now nearing completion, which will launch the bank into its 91st year with new efficiency and new capacity to handle its growing business. You are cordially invited to stop in and see how pleasantly and capably your trust and banking needs can be served by The New England Trust Company.

The New England Trust Company

135 DEVONSHIRE STREET, BOSTON 7, MASS.

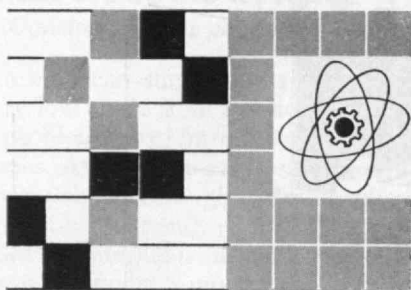
Telephone: HAncock 6-8005

Back Bay Branch: 99 Newbury Street

*Member of the
Federal Deposit
Insurance Corporation*



Incorporated 1869



Put your imagination to work at \$13,000 per year-**SENIOR MACHINE DESIGNERS**

The expanding RCA Semiconductor Division offers an opportunity to join a stable, progressive organization engaged in commercial work.

An outstanding opportunity to conceive, design, and put into actual operation manufacturing equipment for this dynamic industry is available to experienced designers of proven ability.

Previous experience in designing automatic precision equipment for the assembly, fabrication, and processing of intricate parts will further qualify the applicant for a position with this organization.

A DEGREE IS DESIRABLE

- Financial Educational Assistance • Relocation Assistance Available
- Suburban Community

Send resume today to
Mr. R. W. Baumann



**RADIO CORPORATION
OF AMERICA**

Semiconductor and Materials Division,
Somerville, New Jersey

COLLEGE ADMISSIONS — II

(Continued from page 250)

entering class, he does not welcome such queries from interested persons as: "How can I insure the admission of this young man?" The last thing the Admissions Office wants to do is "insure" anyone's admission in advance. It has a responsibility of inter-comparison and selection and will want to wait until all the evidence is in before making it.

College admissions practice in the United States in recent years has given rise to two devices which M.I.T. has not adopted. One which is in current use among the Eastern women's colleges is the "early decision" plan by which a student whose record is strong may, by agreeing to apply only to a single college, gain an early admission in the fall of her senior high school year, subject only to continuing a good record through the year. The other device is the practice of some colleges of visiting schools in the early fall and, after interviewing applicants, classifying them into: Class A, who are virtually assured of admission if they maintain good records; Class B, who are uncertain; and Class C, who will probably not be accepted.

M.I.T. has not adopted these plans because we set a very high value on making the most careful possible selection and on minimizing failures and drop-outs to the greatest possible extent. We do not want arrangements with favored schools which might unfairly lessen the chance of students from more remote or less well-known schools, or of students who apply later. Furthermore, selection for our type of work depends heavily on ability in mathematics and science; therefore we need the additional evidence in the form of mathematics and science test scores which normally reach us in April of the senior year and are seldom available earlier. We also like to get the school marks for the first half of the senior year in school. We feel that the human cost of failures in college is so great that it is far more important to minimize these as much as possible in preference to the alternative, also laudable, of ending the uncertainty as soon as possible. It would be a pleasant world if all uncertainty could be eliminated and we could tell everyone at the earliest possible date just what he wants to hear. This objective, however, is not compatible with the more important one of minimizing failures. We therefore wait until all the evidence is in and send out most of our notices of admission about the first of May. Both schools and students have indicated in almost every case that they appreciate the force of this argument. We give applicants until May 30 to decide whether to accept an offer of admission, so as not to put them under pressure of time.

It is interesting to consider some of the typical questions which visitors ask of admissions officers. Perhaps the most frequent one is, "What are my chances of admission?" or, "What are my chances of getting a scholarship?" The answer to these questions almost always is: "We don't know enough about you at this stage and will have to get a great deal more evidence before we can answer the question." Admis-

(Continued on page 268)



Find out what's new
in corrugated boxes—

Talk to your
H & D Packaging Engineer



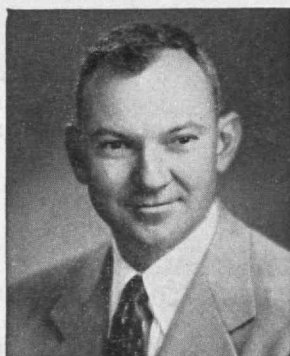
HINDE & DAUCH

Division of West Virginia Pulp and Paper Company

15 Factories • 42 Sales Offices

Sandusky, Ohio

SPECIAL REPORT



Mr. TOM FLOURNOY, JR., C.L.U. NEW YORK LIFE AGENT

at MACON, GEORGIA

BORN: March 18, 1917.

EDUCATION: Mercer University, A.B., 1938.

MILITARY: U. S. Army, April 1945—September 1946.

REMARKS: Tom Flournoy was twenty-one years old when he took his first full-time job as a New York Life representative with the Macon General Office. Right from

the start, Tom's initiative, ability and engaging personality helped him qualify for the Company's Top Club and President's Council—honorary organizations composed of sales leaders among New York Life's representatives. In fact, for 1958, he ranked third in sales in these organizations. In addition, he is a Life and Qualifying member of the industry-wide Million Dollar Round Table. Tom Flournoy's outstanding record plus his active interest in his community's affairs truly exemplify why the New York Life agent is a good man to know—and to be!

Note

Tom Flournoy is now well established in a career as a New York Life representative that is providing him with security, substantial income and the deep satisfaction of helping others. If you'd like to know more about such

a career for yourself with one of the world's leading insurance companies, write:

NEW YORK LIFE INSURANCE CO.
College Relations Dept. M-26
51 Madison Avenue, New York 10, N. Y.

COLLEGE ADMISSIONS — II

(Continued from page 266)

sion, and to a still greater degree, financial aid, is a competitive matter and admissions committees want to make sure they have looked over all the evidence and intercompared all the candidates as fairly as possible before they announce their decisions. So the answer to these questions is: "By all means put in an application, let us have all the necessary data and then we will give an answer as soon as possible."

A favorite question of parents is, "Is he too young to enter college?" The interesting thing about this question is that if you ask almost anyone whether he would have done better in college if he had been two years older when he entered, he will invariably say yes. The difficulty is that the same could be said of almost any experience in life; if we had been a little older when we underwent the experience, we certainly could have dealt with it more effectively. Therefore we come up against the impasse that one cannot wait indefinitely for all the experiences in one's life to start. Very often the best place for this growing-up process to occur is in school or college. So we come back to the conclusion that if a student shows a reasonable probability of having sufficient maturity to plan his own time in college, and come through with an acceptable result, he will probably be better off there than somewhere else, in terms of his long-range development. It is, nevertheless, true that some students are immature enough so that they would do better to get a job or enter the service for a couple of years before their college experience begins.


Another favorite question on the part of students and parents is: "How many applications do you

have?" — immediately followed by the second question: "How many do you accept?" The unspoken assumption that lies back of this inquiry is always that the probability of acceptance here is a direct function of the fraction of applications that are actually accepted. This is true only in a very artificial sense. The student who is well prepared, who has a good school record and test scores, and who gives sufficient indication of maturity to indicate that he can probably come in and do well, is likely to have no difficulty in being admitted even though the number of applications is very large. On the contrary, the student who looks marginal, or whose success is definitely uncertain is probably not going to obtain acceptance even though there is little pressure for admission. This is another way of saying that the most important determinant of the quality of an entering class is not the number of applications, but how good these applications are. If our class is to number 900 and we have 901 really topnotchers applying and anxious to enter, that is all the selection we need. On the other hand, 10,000 applications from people of mediocre qualifications do us little good.

Then, of course, there is the student who says, "How high must my marks be?" The answer to this always is, "You should feel free to get them up just as high as you wish." It is true that high school marks are important indicators of probable future success in college, but they must always be studied in relation to other evidence, such as test scores, and comments from teachers and others who are in direct contact with the student and have seen how he performs.

Similarly, extracurricular activities have a real place in the whole problem of selection. Students

(Concluded on page 270)



Whoever handles liquid . . .
Handles it better and safer
When he takes advantage of
SCULLY Signals, Gauges, Systems.

SCULLY SIGNAL COMPANY

174 Green Street, Melrose 76, Massachusetts

Flow Control

Electronics



**"Precision-Gauged"
HAIRSPRINGS**
 More than 25 years' experience making all types of hair-springs for critical instrument applications. High volume production with absolute uniformity.

PRECISION PRODUCTS COMPANY INC OF WALTHAM
 WALTHAM 54 • • MASSACHUSETTS

BOSTON

NEW YORK

PITTSBURGH

PORTLAND, ORE.



LORD ELECTRIC COMPANY

INC.

FOUNDER, F. W. LORD, M.I.T. '93

64 YEARS OF EXPERIENCE IN ELECTRICAL CONSTRUCTION

*custom-built equipment
for the
mechanical and
process industries*

We develop special equipment and machines from ideas to blueprints — to prototypes — to pilot plants — to the final product or process. Our technical staff and plant facilities are geared to handle the most intricate jobs all the way from small scale laboratory equipment up to contracts in excess of \$1,000,000.

Phone TWinbrook 3-6800 or write to:

Artisan METAL PRODUCTS, INC.

73 POND STREET, WALTHAM 54, MASS.

For a comprehensive summary of our work and the equipment we make, write for our brochure "Process Equipment".

Designers and manufacturers of

AUTOCLAVES • CONDENSERS AND HEAT EXCHANGERS • DISTILLATION EQUIPMENT • EXPERIMENTAL EQUIPMENT • EVAPORATORS • JACKETED KETTLES • MIXERS • PIPE, PIPE COILS, AND BENDS • REACTORS • SPECIAL MACHINERY • TANKS



GEARS

**Made to Your
Specifications**

You and we can form a team—you to draw up the specifications; we to make the gears—that will be profitable to both of us. Gears of all types, all sizes, all materials. Design-engineering service available.

Custom Gears
Exclusively

**DIEFENDORF GEAR
CORPORATION**

Syracuse 1, N. Y.

DIEFENDORF
G E A R S

New Books from the Technology Press

History of the Gear-Cutting Machine

by Robert S. Woodbury

The evolution of gear-cutting mechanisms, emphasizing the effect of the technical development of the machine tool on the development of power, new materials, and production machinery in the Industrial Revolution. \$3.00

The Scanlon Plan

edited by F. G. Lesieur

The first book to appear on the Scanlon Plan, a plan designed to improve the productivity of both labor and management and share the gains equitably. \$4.50

The Physical Chemistry of Steelmaking

edited by John F. Elliott

A symposium presenting the most recent research in the field of steelmaking and designed to stimulate a greater understanding of the research data applicable to steel-making systems. \$15.00

Nonlinear Problems in Random Theory

by Norbert Wiener

Fifteen lectures by the distinguished M.I.T. mathematician that break new ground on the frontiers of applied mathematics. \$4.50

Order from The Technology Press

Cambridge 39, Mass

SPECIALISTS in Pre-Fabricating PIPING



STEEL PIPE: Wrought Iron • Steel • Structural • Cast Iron • Copper-Steel • Electric Weld • Seamless • Spiral, Lap & Butt Weld • Shore-Dredge • Speed-Lay

CEMENT-ASBESTOS PIPE: For sewerage and water mains where corrosion is a problem.

ALUMINUM PIPE: In standard and light walls. All accessories stocked.

PLASTIC (PVC) PIPE

SPEED-LAY: Complete packaged PIPE SYSTEM for fast-laying, temporary and semi-permanent lines for water, compressed air and other services. Write for catalog.

VALVES, FITTINGS & FLANGES: Tube Turns • Dresser • Victaulic • Cast Iron or Steel • Forged Steel • Special Alloys • Water Main

PILING PIPE: Cast Steel and Iron Points • Plates and Shoes • Cast Steel • Malleable Iron Sleeves

COMPLETE FACILITIES for Bending, Coiling, Beveling, Swedging, Flanging, Grooving, Welding, Cutting to Sketch, and Threading to most rigid requirements. Bitumastic or Cement lining — Testing — all to Standard specifications.

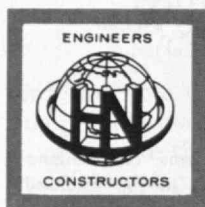
S.G. ALBERT '29 • A.E. ALBERT '56

103-1 VARICK AVE., BROOKLYN 37, N. Y.

Tel.: HYacinth 7-4900

ALBERT

PIPE SUPPLY
COMPANY, INC.



Holmes & Narver, Inc.

JAMES T. HOLMES
M.I.T. '14

D. LEE NARVER
STANFORD '14

Engineering Capabilities

| | |
|------------|---------------|
| Survey | Structural |
| Civil | Architectural |
| Sanitary | Mechanical |
| Electrical | Chemical |

828 SOUTH FIGUEROA STREET
LOS ANGELES 17, CALIFORNIA

SYSKA & HENNESSY, INC.

Engineers

John F. Hennessy '24

John F. Hennessy, Jr. '51



DESIGN • CONSULTATION • REPORTS
POWER PLANT • WASTE DISPOSAL • WATER SYSTEMS
New York City

CHAUNCY HALL SCHOOL

Founded 1828. The School that specializes in the preparation of students for the Massachusetts Institute of Technology.

Ray D. Farnsworth, Principal 533 Boylston Street, Boston, Mass.

ALEXANDER KUSKO, INC.

Consulting Engineers

141 Main Street Cambridge 42, Mass.
ELiot 4-4015

Research and Development in

| | |
|--------------------|---------------------|
| Magnetics | Transistor Circuits |
| Electric Machinery | Control Systems |

A. KUSKO '44
P. N. HELLER '51

J. P. BLAKE, JR. '54
J. A. GAUDET '56

LOCKWOOD GREENE ENGINEERS—ARCHITECTS

Professional Service from Site Selection to Plant Completion

Plant Location Studies

Site Investigations

Complete Design

Supervision of Construction

REPORTS

APPRAISALS

| | | |
|----------|--------------------------------|--------------------|
| NEW YORK | BOSTON, MASS. 316 STUART ST | SPARTANBURG, S. C. |
|----------|--------------------------------|--------------------|

COLLEGE ADMISSIONS — II

(Concluded from page 268)

like to ask how much do these activities "count." The answer of course is, they do not "count." They are an element in the whole judgment that must be brought to bear, but this judgment is not arrived at by a counting process. We are not interested in students who accumulate long lists of clubs and other organizations of which they are members in high school — least of all if this is done to impress admissions officers. The student who has taken a really responsible part and shown initiative in some other activity in high school, no matter how minor, is a far better risk for college than the "joiner" who has little to his credit but being a member. So we look especially for responsible statements from school people who know in detail how active and energetic a student has been and how far he has been willing to broaden his interests and efforts beyond the minimum round of academic work.

There are still many unsolved problems in connection with the selection of students for higher education; these are likely to be intensified at M.I.T. because of the exacting nature of the curriculum. It is significant, however, that students who drop out, either through formal disqualification or for other reasons, do not lack in intellectual ability, nor do most of them lack adequate preparation. Their trouble stems rather from emotional problems which result in poor motivation. Until we gain a deeper understanding of the development of adolescents, it will be difficult to reduce further the percentage of drop-outs. We know little of the psychological forces that turn one student into a purposeful worker and another into an aimless drifter. We cannot always distinguish the "late bloomer" from the nonbloomer.

Tests are a useful, in fact, an indispensable aid to intelligent selection; but tests deal only with peripheral aspects of behavior. The energy and drive that lead to great achievement have their roots deep in the vital energies of the soul. The last half century in psychology has given us glimpses of this turbulent inner world, but we are still far from understanding it. And so for the foreseeable future, it seems probable that efforts to solve these problems of forecasting human behavior will remain in large measure empirical and will lie in the domain of judgment rather than of science.

meissner Engineers

consultants • engineers • constructors

Processing plants. Bulk materials handling and storage. Conveying systems. Ore and minerals processing. Bridge, expressway and interchange design.

JOHN F. MEISSNER ENGINEERS, INC.

300 West Washington Street
Chicago 6, Illinois
ANdover 3-1944

R. C. MEISSNER '43

PROFESSIONAL CARDS

JACKSON & MORELAND, INC. JACKSON & MORELAND INTERNATIONAL, INC. *Engineers and Consultants*

ELECTRICAL—MECHANICAL—STRUCTURAL
DESIGN AND SUPERVISION OF CONSTRUCTION
FOR
UTILITY, INDUSTRIAL AND ATOMIC PROJECTS
SURVEYS—APPRAISALS—REPORTS
MACHINE DESIGN—TECHNICAL PUBLICATIONS
BOSTON NEW YORK

EADIE, FREUND & CAMPBELL CONSULTING ENGINEERS

500 FIFTH AVENUE NEW YORK 36, N. Y.

Mechanical—Electrical—Sanitary
Air Conditioning—Power—Process Layouts
James K. Campbell '11

METCALF & EDDY *Engineers*

Water, Sewage, Drainage, Refuse and
Industrial Wastes Problems
Airports, Laboratory, Valuations
Statler Building, Boston 16, Mass.

THE KULJIAN CORPORATION *Consultants • Engineers • Constructors*

UTILITY • INDUSTRIAL • CHEMICAL

Power Plants (Steam, Hydro, Diesel), Textile Plants,
Water & Sewage Works, Oil Refineries, Pipe Lines,
Army & Navy Installations, Air Fields, Hangars

H. A. Kuljian '19 A. H. Kuljian '48
1200 NO. BROAD ST., PHILADELPHIA 21, PA.

FABRIC RESEARCH LABORATORIES, INC.

Research, Development, and Consultation
In the Fields of Fibrous, Organic, and Related Materials

1000 Providence Highway Dedham, Mass.
(At Route 128 and U.S. 1 Interchange)

W. J. HAMBURGER, '21 K. R. Fox, '40 E. R. KASWELL, '39

GILBERT ASSOCIATES, INC.

ENGINEERS AND CONSULTANTS

Malcolm G. Davis '25, Vice President
Allen W. Reid '12 E. C. Edgar '35

Steam, Hydro, Diesel, Nuclear Power Plants; Industrial
Structures; Plant Safety, Utility Rates, Valuations, Reports;
Purchasing; Chemical Laboratory

New York • READING, PA. • Washington

LAUREN B. HITCHCOCK ASSOCIATES *Chemical Engineers*

Industrial Research & Development
Technical & Economic Evaluations
Acquisitions of Processes and Plants

Commercial Chemical Development—Air Pollution Control

Lauren B. Hitchcock '20 Technical Advisor, John H. Schaefer '26
60 East 42nd Street New York 17, N. Y.

FAY, SPOFFORD & THORNDIKE, INC. *Engineers*

Airports, Bridges, Express Highways
Water Supply, Sewerage and Drainage Systems
Port and Terminal Works
Industrial Plants Incinerators
Designs Investigations
Supervision of Construction
Boston, Massachusetts

CLEVERDON, VARNEY & PIKE *Consulting Engineers*

HERBERT S. CLEVERDON '10 WALDO F. PIKE '15
JOHN A. DOW '23 HAROLD E. PROCTOR '17

Structural Designs Foundations
Heating, Ventilating, Electric and Plumbing De-
signs, Industrial Buildings, Reports, Investigations

120 TREMONT STREET BOSTON 8, MASS.

MAURICE A. REIDY *Consulting Engineer*

BRIDGES STRUCTURAL DESIGNS BUILDINGS
CONSTRUCTION CONSULTANT AND ARCHITECTURAL ENGINEER FOUNDATIONS

Estimates and Appraisals

101 TREMONT STREET BOSTON, MASS.

CHARLES NELSON DEBES ASSOCIATES, INC. ENGINEERS AND ARCHITECTS

Structural, Electrical, Mechanical, Acoustical
Industrial, Commercial and Municipal Projects

915 EAST STATE ST. ROCKFORD, ILL.
C. N. DEBES '35

MORAN, PROCTOR, MUESER & RUTLEDGE CONSULTING ENGINEERS

Foundations for Buildings, Bridges and Dams;
Tunnels, Bulkheads, Marine Structures, Soil Studies and
Tests; Reports, Design and Supervision

WILLIAM H. MUESER '22 PHILIP C. RUTLEDGE '33
415 Madison Ave., New York 17, N. Y.

BREWER ENGINEERING LABORATORIES *Consulting Engineers*

Electric Strain Gage Testing • Stress Analysis
Strain Gage Amplifiers • Strain Gage Switches
High Temperature Strain Gages

MARION, MASS. TEL. 103
G. A. Brewer '38 S. P. Cammack '57

CAPITOL ENGINEERING CORPORATION CONSULTING ENGINEERS DILLSBURG, PENNSYLVANIA

Highways Airports Reports
Water Supply Surveys
Sewage Treatment Design
Bridges Construction Supervision
Soil Testing

Branch Offices

Rochester, N. Y. Saigon, Vietnam
Robert E. Smith '41, Vice President



and the prophet replied:

*"It is well to give when asked, but it is better to give unasked, through understanding."**

Gifts by Will

TO THE

Massachusetts Institute of Technology

The tale is told of Almustafa, the prophet, who, having awaited for many years the ship that would return him to the place from whence he came, was making the final descent to the shore when the folk of Orphalese crowded about him. They besought him before departing to "disclose us to ourselves, and tell us all that has been shown you of that which is between birth and death."

With words of wisdom, an answer appropriate was given to the woman holding a baby, to the ploughman, to the merchant. Begged one, "Speak to us of GIVING," and the prophet replied:

"It is well to give when asked, but it is better to give unasked, through understanding;

And to the open-handed the search for one who shall receive is joy greater than giving. All you have shall some day be given;

Therefore give now, that the season of giving may be yours and not your inheritors'."

Through the years the prophet's words have held true, for even today he who "through understanding" includes the MASSACHUSETTS INSTITUTE OF TECHNOLOGY as a beneficiary in his will can experience thereby a two-fold satisfaction. The successful culmination of his search for a worthy recipient and the anticipated results his generosity will assist in accomplishing. These satisfactions give an added value to the span of man's days and project his usefulness to his fellowmen far into the future.

The Massachusetts Institute of Technology because of the high quality of the education given its students, its effective research work for aiding America in peace as well as in war, and the high character of its governing body and academic staff qualifies as an institution for serving our American ideals for the present and in the years to come.

But the search, the finding, and the anticipated accomplishments are not enough; for without the properly-worded record, man's plan for the future may go awry. Hence the prophet's importuning, "—give now," should be heeded. The giving need not be an immediate physical transaction, for written directions replace the spoken word when the speaker is no longer present, and a donor can frequently make by will a gift which is larger than he can make while living. Truly, *"it is well to give when asked, but it is better to give unasked, through understanding."*

A booklet "Gifts by Will," outlining different forms of bequests to M.I.T., is available to you or to your attorney by writing to:

Director of Development
Massachusetts Institute of Technology

Cambridge 39,

Massachusetts

* "The Prophet" by Kahlil Gibran

ALUMNI AND OFFICERS IN THE NEWS

Rapidly Rising . . .

In addition to the 34 Alumni recorded on page 235, others have advanced as follows:

VERNON C. COLE'21 as production superintendent, Connecticut Light and Power Company . . . C. FORD BLANCHARD '22 as chief of the Division of Finance and Statistics, Office of the Chief Accountant, Federal Power Commission . . . HUGH A. CORR'23 as chief of construction, District Two, Department of Public Works, Commonwealth of Massachusetts;

JOSEPH MCBRIEN'31 as county administrator, Contra Costa County, California . . . LESTER GLICKMAN'32 as president, Association of Civilian Supervisors in the Naval Underwater Ordnance Station, U.S. Navy Central Torpedo Office, Newport, R.I.;

ARTHUR L. CONN'34 and ROBERT A. STEEL'38, respectively, as head of technical service and head of process design and economics, Whiting research laboratories, Standard Oil Company (Indiana) . . . MARIO G. VANGELI'34 as supervisor, European interests, Raytheon Manufacturing Company.

FREDERICK F. O'BRIEN'35 as medical examiner, fifth Plymouth district, Commonwealth of Massachusetts . . . ELMER W. L. DAVIS'36 as head, research equipment section, Engineering Division, Arthur D. Little, Inc. . . . ALBRECHT E. REINHARDT'37 and HARRY E. GRAVLIN,

JR., '50, respectively, as development engineer and production manager, Hamilton Standard Division, United Aircraft Corporation;

OSKAR J. KANTER'38 as a director, Beverly Trust Company, Beverly, Mass. . . . C. WILLIAM GUY'39 as assistant general manager, Rocketdyne, division of North American Aviation, Inc. . . . ALBERT O. JARVI'39 as head, Structural Engineering Department, Cornell, Howland, Hayes and Merryfield, Corvallis, Ore.;

ALEXANDER SQUIRE'39 as manager, Materials Department, Bettis Atomic Power Division, Westinghouse Electric Corporation. . . . WENSLEY BARKER, JR., '40 as staff engineer, Chandler-Evans Corporation, West Hartford, Conn. . . . WALTER W. MIEHER'41 as engineering manager, Countermeasures Division, Sperry Gyroscope Company;

MORRIS A. STEINBERG'42 as manager, materials projects research, Lockheed Aircraft Corporation Missile Systems . . . JOHN T. CASTLES'47 as manager, Chemical Development Department, General Electric Company, Bridgeport, Conn. . . . ARTHUR J. RENZ'48 as sales manager, Split Ballbearing Corporation, Lebanon, N.H.;

RALPH L. WENTWORTH'48 as manager, Shoe Products Research Department, Dewey and Almy Chemical Division, W. R. Grace and Company . . . CHARLES A. CHURCH'50 as assistant production manager, D. S. Kennedy and Company, Cohasset, Mass.

Recently Written . . .

Bookshelf additions authored by M.I.T. Alumni and staff members include the following volumes:

Island Yesterdays, by NORMAN M. CHIVERS'05. Filled with historic and geographic facts about the Philippines almost 50 years ago, the book is a skillfully told narrative colored by the recollections of a young engineer who directed the construction of the Manila Railroad. (New York: Pageant Press, Inc., 1958, 89 pages, \$3.00.)

The Uncommon Man: The Individual in the Organization, by CRAWFORD H. GREENEWALT'22. This is the third volume in the McKinsey Foundation Lecture Series sponsored by the Graduate School of Business, Columbia University. (New York: McGraw-Hill Book Company, February, 1959, \$3.75.)

History of the Gear-Cutting Machine, by ROBERT S. WOODBURY'28. The monograph traces the history of gear cutting through four centuries, describing and analyzing the development of machines on which gears have been and still are made. (Cambridge: The Technology Press, 1958, 135 pages, \$3.00.)

Scratches on Our Minds, American images of China and India, by HAROLD R. ISAACS, research associate, Center for International Studies. (New York: John Day Company, Inc., 1958, 416 pages, \$6.75.)

American Automobile Manufacturers, by JOHN B. RAE, Associate Professor of History. This history of the first 40 years of the automobile industry points up competition among the giants of the industry and also traces the beginnings of cooperative efforts. (Philadelphia: Chilton Company, 1959, 223 pages, \$6.00.)

Rightly Rejoicing . . .

Among the Alumni to whom birthday congratulations are appropriate during the month of March are GEORGE B. MARKOE'84 who marks his first 100 years on the 18th; OSCAR E. NUTTER'87 who turns 95 on the 3d; JOHN W. KITTREDGE '94 who becomes 90 on the 28th; three who mark their 85th year; and eight who reach their 80th birthday, as listed below with dates of birth:

March, 1874 — ALICE N. DIKE'03 on the 14th; GERALD H. MATTHES'95 on the 16th; and HAROLD S. BOARDMAN'96 on the 31st.

March, 1879 — HARRY J. LOHBILLER '02 on the 5th; EVERETT P. TURNER'02 on the 6th; FREDERICK W. SMITH'01 and SUMNER HAZLEWOOD'01 on the 7th; WALDO G. WILDES'01 on the 21st; ROBERT S. BALDWIN'02 on the 25th; EDWARD H. DAVIS'01 on the 27th; and E. WINCHESTER HOWELL'03 on the 31st.

With the addition of these 14, there will be a total of 77 nonagenarians and, in addition, 743 octogenarians on the rolls of the Alumni Association.

Obituary

WALTER E. HOPTON'91, October 20*
EDWARD W. ABELL'94, 1957*
CHARLES B. BEACH'94, January 4
CHARLES M. ADAMS'95, January 15
FREDERICK L. RICHARDS'95, July 8*
JOHN C. GREENLEAF'99, January 18, 1958*
CARL S. MILLIKEN'99, November 19*
DONALD A. KOHR'01, June 14*
BARTHOLOMEW E. SCHLESINGER'01, December 15*
MRS. EDNA S. RAMSEYER (EDNA D. STODARD)'03, December 20*
MARK G. MAGNUSON'04, December 10*
PRESTON M. SMITH'04, December 22*
LEAVENWORTH P. SPERRY'04, November 22*
JAMES M. BUCHANAN'06, December 14*
HOWARD H. MCCHESENEY'07, December 7*
BRYANT NICHOLS'07, January 9*
EDWIN M. PRICE'08, January 11, 1957
CHARLES CAMSELL'09, December 20*
FREDERICK J. KING'09, January 21
CHARLES A. MAGOON'11, November 9*
CHARLES B. MAGRATH'11, November 8
FREDERICK W. BARKER'12, December 10*
LEROY A. MATTHEWS'12, no date given*
EDMUND G. BROWN'13, January 29
JOHN P. GALLAGHER'13, July 30
CARL L. STUCKLEN'13, November 9*
NORRIS E. KIMBALL'15, December 18*
HOWARD L. KING'15, September 21*

NELSON W. TURNER'15, October 29*
FRANK E. RICHARDSON'16, July 4
BERNARDO SAMPER'16, 1948
ROBERT N. GAY'17, January 9
ROBERT J. MARLOW'17, December 10*
THEODORE E. STAHL'17, December 4*
RALPH L. WHITCOMB'18, January 11
MRS. GUSTAVE M. WEIL (ELLEN E. WILLIAMS)'19, 1957*
WALTER C. HAGERTON'21, January 4
BENJAMIN F. ADAMS'22, November 4
CHARLES R. BARTON'22, October 10*
JOSIAH R. ELLIOTT, JR., '23, May 21, 1958
SOMERBY R. EVANS'23, November 6
MARSHALL S. SIMPSON'23, November 29*
ARTHUR W. GRAVES'24, November 17*
JAMES P. HUGET'24, November 3*
WILLIAM W. SCRIPPS'25, November 10*
MANUEL V. PATINO'29, October 12
NORMAN F. O'SHEA'30, November 24*
EGERTON E. SMITH'30, June 9, 1958*
MRS. FRANK W. CARPENTER (MARIA W. BATES)'33, November 17*
J. DILLARD COLLINS'33, January 10*
EARLE D. MCLEOD'33, November 15*
CHARLES N. ENDWEISS'36, September*
WILLIAM M. NELSON'36, July 8*
DANIEL A. NORMAN'36, 1957*
CLEON C. DODGE'37, January 4
FRANK J. O'NEIL'40, November 29*
GEORGE LYNDE GATELY'42, January 6
LELAND G. DURHAM'47, September 22
*Further information in Class Notes

NEWS FROM THE CLUBS AND CLASSES

CLUB NOTES

Central New York

There have been no meetings of the club since the last issue of *The Review*, but there are several items of interest which should be reported. First it is with deep regret that we announce the death of Frederick W. Barker '12 on December 10, 1958. Fred had long been active in the affairs of the club, and he had contributed liberally of his time and effort to help strengthen it. We shall remember him most for his work in establishing the M.I.T. Club of Central New York scholarship fund, which has been used to great advantage this year.

Second, it is with great pleasure that we announce that Gregory G. Gebert '50 and Dr. Dewey J. Sandell, Jr., '49 have been appointed to the Educational Council of the Institute. Greg is a development engineer and Dewey is director of research at Carrier Corporation; they will be two of the seven Council members in the Syracuse area. These men work closely with secondary schools and youth groups counseling students on the scientifically oriented education which the Institute represents. — PAUL B. OSTERGAARD '49, *Secretary-Treasurer*, 111 Sherbrooke Road, East Syracuse, N.Y.

Kansas City, Missouri

The M.I.T. Club of Kansas City met for a luncheon meeting on December 27 at the Empire Restaurant on the Country Club Plaza. This meeting was held during the Christmas holidays so that the club could invite the undergraduate students from the Kansas City area to become acquainted with the Alumni and the M.I.T. Club of Kansas City. The undergraduate students from the area were the guests of the M.I.T. Club. Fathers of the undergraduate students also attended the luncheon. Because it was the holiday season, we had two members of other clubs attending our luncheon. John Kirkpatrick '48, a member of the M.I.T. Club of Chicago, and Pete Bulkley '55, a member of the St. Louis club, attended. Also in attendance was Edward E. Huckle '51, who is now on the faculty at the University of Michigan.

Before the luncheon began, a social period was held at which time the Alumni, students, and fathers became acquainted. After the luncheon was served Bob Solem '61, one of the undergraduate guests, gave the club his impressions of M.I.T. at the present time. Angus McCallum '34 spoke on "Complete Education For Engineers at M.I.T."

Alumni who were in attendance were: R. L. Brown '44, Tom Eggert '50, Warren Evans '39, Jim Irwin '18, A. C. Kirkwood '24, Betty Ann Lehmann '54, Fred Lehmann '51, Angus McCallum '34, Ed Martin '51, John Nason '23, Lou Robinett '36, Paul

Walter '56, Everett Weatherly '29, Dick Wheeler '25. Students attending were: Tom Albrecht '61, Peter Bankson '61, Roger Beck '62, Robert Brown '61, Jon Bulkley '60, Bob Gottlieb '60, R. Graham '60, Joe Hendren '59, Richard L. Horton '62, Bob Solem '61, Ron Sundelin '61, Richard Sutton '62, Norman Weiss '61, Wesley Wolf '62. Other guests attending were: Rod Bankson; Russ Beck; A. W. Brown; Bill Cohen; M. Gottlieb; Lloyd Graham; G. W. Hendren, M.D.; Earl Horttor; Michael K. Maul; Arnie Solem; Ron Sundelin; Richard Sutton; Clarence W. Wolf; and Si Yukon. — B. L. HAKAN '42, *Secretary*, 1708 Campbell Street, Kansas City, Mo.

Kentucky

The M.I.T. Club of Kentucky had the pleasure of having its October meeting at Little Springs Farm, the home of James R. Kane '44, President of the Kentucky club. The presence of the wives and a delicious charcoal broiled steak dinner resulted in a most delightful evening. Those attending were: Mr. and Mrs. Edward J. Schickli, Jr., '50; Mr. and Mrs. Walter R. Weeks '24; Mr. and Mrs. A. M. Prentiss '25; Mr. and Mrs. A. L. Entwistle '26; Mr. and Mrs. D. R. Goodman '40; Mr. and Mrs. Arthur Cary '34; Mr. and Mrs. Ted Metzger '50; Mr. and Mrs. James R. Kane '44; Mr. and Mrs. John D. Harms '48; and Mr. and Mrs. George C. Morrisette '35.

The December meeting was held at the Louisville Pendennis Club. At this dinner meeting the new officers for the 1959-60 period were elected. The new president is Mr. Richard E. Christie '39, Manager of Product Planning, Dishwasher and Disposal Department, General Electric Appliance Park. The secretary-treasurer is Mr. John L. Dawson, Jr., '44, President of Dawson Lumber Company.

Mr. James R. Kane '44, the outgoing President, was complimented on the fine job and the interest which he gave to the club during his term. One of the highlights of this term was the establishment of an M.I.T. Club of Kentucky scholarship fund. This fund has as its purpose the provision of an M.I.T. scholarship for a deserving Kentuckian. Those attending the December meeting were: Messrs. W. H. Barnes '38; Arthur Cary '34; John L. Dawson, Jr., '44; Albert L. Entwistle '26; John D. Harms '48; James R. Kane '44; Ted R. Metzger '50; George C. Morrisette '35; Edward J. Schickli, Jr., '50; Elmer A. Skonberg '29; Frank P. Wardwell '38; Walter R. Weeks '24; and Jasper D. Ward '44. — JOHN D. HARMS, *Secretary*, 10002 Old Third Street Road, Valley Station, Ky.

Monterrey

On occasion of the Christmas holidays Mr. Harold E. Lobdell '17 and his wife Conchita stopped by Monterrey on last December 19, on their way to Mexico City.

Several Alumni got together at an informal lunch to greet him for Christmas and the new year.

Attending were: Bernardo Elosúa '23, President; Rodolfo F. Barrera '49; Manuel R. Llaguno '46; Lauro Martínez Carranza '20; Alberto P. González '01; Eliot Camarena '44; José V. Ferrara '54; Raúl Sada Rangel '49; Julio de la Fuente '33; Commodore Penn L. Carroll '17; Marcos Manuel Suárez '55; and José M. Borrego '57. — ELIOT CAMARENA '44, *Secretary*, Sucursal "J," Monterrey, N. L. México.

New York

More than 100 people attended the technical seminar held in the Key Room of the Biltmore Hotel during the lunch hour on January 15, 1959. Howard W. Johnson, Associate Dean of the School of Industrial Management and Director of the Executive Development Program at M.I.T., spoke informatively and interestingly on executive development programs which currently form a part of the curricula in some 30 colleges and universities. Norman P. Blake, Vice-president, Atlantic Division, Pan American World Airways, acted as master of ceremonies and introduced the speaker. Informal discussion after Mr. Johnson's talk was limited only by the time of day and the need for getting back to work. John B. Calkin '32 was chairman for this technical seminar, and James Margolis '52 assisted in handling the arrangements.

At this writing we are looking forward to the annual technical dinner scheduled for the evening of February 5, 1959. Dr. C. Stark Draper '26, Head of Aeronautical Engineering at M.I.T., will moderate a panel discussion on the conquest of outer space. We will report on this event in the next issue of *The Review*. — VERNON O. BOWLES '33, *Secretary*, Holly Ridge Farm, Katonah, N.Y.

Northern Texas

The Dallas M.I.T. Alumni held their annual joint Christmas party with the Fort Worth club on December 22 at the new Western Hills Inn, midway between the two cities. After a convivial cocktail hour around the fireplace overlooking the pool, a delicious roast beef dinner was served in the ballroom.

Following dinner both groups presented entertaining programs featuring home-grown talent. The Dallas group put on a television show in which typical M.I.T. "characters" related what had happened to them since graduation. Participants included our president, Russ Clark '29; Bob Harrison '47; Chet Haig '40; Connie Lau '42; Howard Marx '48; Betty Marx; H. E. Lobdell '17 (by radio from outer space); Bob Lichten '43 as master of ceremonies.

Later Dallas wives Kit Haig, Peg MacDonald, Anna Stevens, Carol Wadel, and Audrey Weyand edged out a gallant team of Fort Worth men in charades.

Attending the party from Dallas were the following Alumni: Linwood P. Adams '42; Edwin S. Bell '48; Chester A. Briggs '44; Aubrey I. Chapman, Jr., '50; J. Russell Clark '29; A. Earl Cullum, Jr., '31; Maxcy D. Daggett, Jr., '46; Jay N. Fues '54; Irwin J. Grossman '52; Chester R. Haig, Jr., '40; G. Scott Hammonds '34; Robert E. Harrison '47; Lloyd A. Haynes '49; Thomas E. Huffman '23; Homer A. Hunter '32; Jay F. Koogle '53; Conrad Albert Lau '42; John Lawrence '32; Robert L. Lichten '43; J. Ross Macdonald '44; Howard F. Marx '48; Douglas A. Nettleton '52; Mrs. Weston K. Norman '47; Jonathan A. Noyes '12; Clifford Read '18; James W. Salassi '50; Raymond C. Sangster '51; John E. Stevens '44; Allen B. Thompson '50; Louis B. Wadel '46; Edmund E. Weynand '50; Leonidas P. Whorton '35; W. Tom Wollny '58; and John P. Young '52. — ROBERT L. LICHTEN '43, *Secretary*, 6338 Aberdeen Avenue, Dallas 30, Texas.

Panama

The M.I.T. Club of Panama was honored by a two-day visit from Mr. H. E. Lobdell '17, Executive Vice-president of the M.I.T. Alumni Association, and Mrs. Lobdell, who arrived in Panama on January 10 and left January 12 for Colombia.

On the evening of their arrival, Mr. and Mrs. Lobdell were guests at a cocktail party at the home of Governor W. E. Potter '33, after which a dinner meeting for M.I.T. Alumni and their wives was held in the Fern Room of the Tivoli Guest House in Ancon, Canal Zone.

The Alumni attending were as follows: Jaime Berrocal '47; Richard R. Brown '35; Manuel P. Calderon '30; C. W. Chase, Jr., '34; Fernando L. Eleta '47; Isidro Fong '47; Eduardo Icaza A. '23; H. E. Lobdell '17; David J. Lopez '29; Colonel John D. McElhenny '39; I. F. McIlhenny '23; Major General W. E. Potter '33; Antonio J. Sucre '31; T. Theokistou '48; Frank Zeimet '47.

On Sunday, January 11, Mr. and Mrs. Lobdell made a tour of the Miraflores Locks and took a launch ride through the Panama Canal from Gamboa to Pedro Miguel. — C. W. CHASE JR., '34, *Secretary*, Box 77, Balboa Heights, Panama C.Z.

Rochester

Our annual meeting was held in September, and its outstanding feature was a steak dinner prepared under the direction of Stan Jensen '48. The following officers were elected for 1958-'59: Robert E. Smith '33, President; E. Phillip Kron '44, President-elect; Leo Cravitz '44, Vice-president; William E. Summerhays '41, Treasurer; Arnold Mackintosh, Jr., '44 Secretary; John S. Goldey '44, Assistant Secretary; Gordon L. Calderwood '27 and Evan A. Edwards '37, executive committee. Stan Wells '30 called to the attention of the group retiring president Fred ('38) Kolb's long and meritorious service. Fred has been an officer since 1943, including 11 years as secretary.

Phil Kron has prepared a directory of M.I.T. Alumni in the Rochester area. The directory is being mailed by the Treasurer to dues-paying members. In October a meeting was held at which 30 members heard Professor George Wadsworth '30

discuss Operations Research. Our most recent meeting was our Christmas luncheon on December 30, at which approximately 45 members entertained 15 M.I.T. students from this area and 15 high school seniors interested in attending the Institute. Representatives of each undergraduate class gave brief reviews of student and class activities, and Professor A. A. Ashdown '24 spoke on progress and future plans at M.I.T. President Bob Smith attempted to find out the number of years our Christmas luncheon has been held. No definite date could be established for the first meeting, but Dr. C. J. Staud '24 assured us it was an annual event when he graduated. The Secretary would appreciate hearing from anyone who can give us an exact date. — ARNOLD MACKINTOSH, JR., '44, *Secretary*, 164 Glen Haven Road, Rochester 9, N.Y.

CLASS NOTES

1891

The Secretary has received from the office of The Review notice of the death of Walter E. Hopton. Date of death is October 20, 1958. For the past two years we have received no word from Walter. For many years he was a resident of Syracuse, N.Y., and he had a business in that city. A loyal and faithful member of the Class, we counted on him always. Any of you fellows who have had contact with him, be so good, please, as to write the Secretary. We wish our records of these good men to be clear and complete, and you can help us to do it.

A letter dated December 26 has come from the daughter of Carl Bunker to tell us that her father is in the Peter Bent Brigham Hospital in Boston; has been there for nine weeks and had two surgical operations. She visits him daily when possible, but he finds it hard to keep up courage. Here is another of our first-rate men of Technology '91. Why don't you who remember sit down and write him a card? Send it through his daughter, whose address is: Mrs. Harry Revell, 32 Pemberton Road, Cochrane, Mass. That's a good fellow. Thank you! Carl will be 90 years old on June 3.

Ernest Tappan has sold his house at 15 Walnut Street, Newtonville, Mass., where he has lived for many years. The Secretary has not as yet received a permanent address to set down.

Bradford Choate, dear man, has moved from Carmel by the Sea, Calif. His new address is 27 Engle Road, San Mateo, Calif. His wife, who has been ill, is better; and the road ahead seems pretty good to cheerful Bradford and his wife, Rose. Bradford, born and bred in Salem, Mass., the son of a judge of the local court, has, since leaving Tech, lived in many of the states of this United States; he now is wedded to California. — WILLIAM CHANNING BROWN, *Secretary*, 15 Forest Avenue, Hastings-on-Hudson, N.Y.

1894

Our distinguished and devoted class president, Horace Crary, has suggested to

the Secretary that we should attempt to have a class reunion in June to celebrate, along with other important things, the 65th anniversary of our graduation from M.I.T. The suggestion is an excellent one, and as there are to be some highly interesting events at that time the Secretary proposes to contact by letter all the members of the Class for whom he has addresses. At present there are living 21 of our original 138 members who received degrees in 1894, and it is to be hoped that as many of them as are physically able will make an effort to be here. A local committee will be ready to help in any way possible.

Unquestionably Charles Abbot is the most distinguished scientist whom the Class produced. That he is still ably doing scientific work as a research associate of the Smithsonian Institution is made evident by an article in the latest number of the *Smithsonian Contributions to Astrophysics* emphasizing his opinions as to the value of his many years of research on the solar constants in their relation to long-range weather forecasting. From his own studies he has been able to predict far in advance periods of drought and of excessive rainfall. May his fame be great as his work is recognized.

Although delayed for lack of early information, the Secretary has to report the death of Edward W. Abell, who passed away in 1957. Abell was an 1891 graduate of Yale who came to M.I.T. to do professional study in electrical engineering; he was associated with our Class during the junior and senior years, but did not take a degree with us. Presumably his affiliations were with his Yale class, but he was very highly regarded by his fellow students here. It is impossible to give a complete account of his career, but he was for a number of years a professor at Acadia University, at Wolfville, Nova Scotia, and following his retirement lived at Folsom, Pa., where he died. Our belated sympathy has been expressed to a daughter now residing at Holmes, Pa.

The Secretary has recently been commissioned to write the history of the Refrigeration Research Foundation, Inc., an organization which has contributed greatly to the scientific development of the cold storage industry. The Foundation was organized in 1943 "to advance the art of refrigerating commodities" and has had a highly successful career which is constantly increasing in its usefulness. It was the happy fortune of the Secretary to be chosen as the chairman of the board of governors at its beginning, a position which has been continuous through the 15 years. In this capacity he is one of a group representing the public, and it has been an experience in which he has had deep satisfaction and has had especially happy relations with many leaders in the industry who have been fellow members of the board and with his other public associates. It will be a pleasant task to write the history of this outstanding organization. Another honor which has recently come to the Secretary has been the request from the William Underwood Company that a new Control and Development Laboratory recently established by the Company, which is the oldest canning firm in America, might be called the Underwood-Pres-

cott Laboratory, in recognition of the fundamental research carried on in association with William Lyman Underwood '98 in the last half of the last decade of the previous century. Nothing could be of deeper satisfaction, even after more than 60 years after the time when this work was being done. More about it when we meet for our 65th in June. — SAMUEL C. PRESCOTT, *Secretary*, Room 16-317, M.I.T., Cambridge 39, Mass.

1895

From Miss Maud S. Richards, 75 Avon Street, Somerville 43, Mass., comes the following note: "Dear Mr. Yoder: I do not know that you have been informed of the death of my brother Frederick L. Richards on July 8, 1958. He had been at his summer home at Cape Porpoise, Maine, only a few days when he became very ill and passed away at a hospital.

"Mr. Richards had lived in Somerville, Mass., since early childhood and prepared at the Somerville High School for M.I.T. Before retiring some years ago, Mr. Richards was with Densmore, LeClear, and Robbins, architects and engineers, in Boston. Mr. Richards leaves a sister with whom he lived."

Your Secretary spent three weeks around Christmas and New Year's Day in the hospital with slight heart trouble. He returned home early in January. — LUTHER K. YODER, *Secretary*, 69 Pleasant Street, Ayer, Mass.

1896

Paul Litchfield has just retired from active administration of the Goodyear Tire and Rubber Company, but remains as honorary chairman of the board of directors. He was honored at a dinner in Akron on last December 15. John S. Knight, the toastmaster, said: "Although Paul Litchfield has won world renown as an inventor and top flight industrialist, I have been more intrigued by his personal and business philosophy. . . . But his thinking reveals no academic rigidity. He wisely observes that a 'reasonable' number of mistakes cannot be avoided, and adds that the man who makes few mistakes usually makes few discoveries. . . . Tonight's great outpouring of your friends to do you honor demonstrates far beyond my limited capacity of expression the high esteem and affection with which you are held in the hearts of your community. May the satisfactions of life, set forth so eloquently in your own personal creed, continue to bless you and yours. . . ." After several speakers paid their tribute, Paul responded: "This evening will go down in my memory as a great occasion. Akron has grown into a great city and I appreciate your feeling. When I came here I was given the greatest thing a man can have — opportunity. Frank Seiberling gave me every opportunity to develop. I have tried to pass that on to others by selecting people with possibilities and giving them opportunities to expand. I have been blessed with a good wife. These things are invaluable. Thank you."

The woman's editor of the *Beacon Journal* says the honorary dinner had none of the stuffy earmarks of a banquet, rather

the warm fellowship and good spirits of a family dinner party. To assist and share in the honors were Paul's 'good wife' Florence; his daughters, Katherine and Edith, with their husbands, A. Wallace Denny and Howard Hyde; his grandchildren, Julie (Mrs. James E. Sweeney), Pam (Mrs. John Blackford), and Alan and Paul Hyde with their wives, Polly and Sherry.

The *Akron Beacon Journal*, on the day of the dinner, published a special edition that gave a detailed history of the Goodyear Company: from the purchase for \$13,500 of an abandoned strawboard factory 60 years ago to the present holdings of 22 plants and six plantations in foreign countries. Mr. F. A. Seiberling early saw the chance of changing from the making of carriage and bicycle tires to tires for autos. In 1900 he came to Boston and hired Paul, later familiarly known as P.W., as superintendent. P.W.'s first challenge was to overcome the handicap of an allotment of less than two per cent from the monopoly that controlled the clincher tire. He met the challenge by inventing the straight side tire that had a bead with a wire running through it that could be locked to the wheel. This invention and advertising brought the first large profit to the company in 1910. The price of crude rubber was three dollars a pound; the company sold one-third of the original equipment auto tires. A cotton plantation was started in Arizona and a rubber plantation in Sumatra.

In the first world war the company furnished tires, rubber pontoons, balloons, and blimps for the military. The first depression after the war caught the company in a severe financial vise. In the reorganization, P.W. became vice-president; in five years control was returned to the stockholders. P.W. became president in 1926, and the company became the world's largest rubber company. A subsidiary was given a contract to build great airships *Akron* and *Macon*. *Akron* was launched and lost off Barnegat, N.J., in a violent storm on April 12, 1933; *Macon* was wrecked on the Pacific Coast on February 12, 1935. The final end of airship construction came with the explosion of the *Hindenberg* at the mooring mast in Lakehurst, May 6, 1937.

During World War II Goodyear went all out for war material. The Japanese took over the plants and Goodyear holdings in the Philippines, Java, and Sumatra; this action reduced the supply of natural rubber. Goodyear had made synthetic rubber; it and other companies were called on to run synthetic plants the government built. During World War II, the blimps had been in production; they and balloons were in urgent demand for convoys and scouts; also in demand were self-sealing fuel tanks, life rafts, and many articles and machines on land, water, and air that required rubber in some part. Various plants made field artillery, shells and bullets, tank tracks; and one plant made Corsair fighter planes for the Navy. When the war was over there was naturally an immense curtailment and cancellation of government orders. The company now has 100,000 employees and continues to be the largest rubber company anywhere in the world.

The Class rejoices in Paul's remarkable career and wishes him a pleasant retirement that eases responsibilities and still keeps him in service. — JAMES M. DRISCOLL, *Secretary*, 129 Walnut Street, Brookline, Mass. HENRY R. HEDGE, *Assistant Secretary*, 105 Rockwood Street, Brookline, Mass.

1897

Your Secretary had a delightful get-together with Charles Dunn, Course II, formerly a judge in Pennsylvania, who was visiting his daughter in Boston. He came to lunch at the Union Club and told us of his plan for a large public storage basin for distributing natural gas in the Northeast. In his native Clinton County, Pa., there is a huge volume of mined-out gas wells available for such a project. As a lifelong friend of Tom Weymouth — who also was a native of Lock Haven, Pa. — Charlie hopes to have the storage basin named for Tom in honor of his prominence in the gas industry. This action is most appropriate.

We enjoyed going over old times — a delightful hour of nostalgia — including our mutual efforts as toe dancers in the ballet in a Tech Show in the "gay Nineties"; now it is not too easy to lift one foot above the other.

The following from Jere Daniell, under date of December 29, refers to an article describing the modern but unseemly costumes allegedly worn on their way to classes by some Technology students (but we can't believe by many) whom the author passes as he drives over the Harvard Bridge toward Boston. Sketches showed boys wearing overalls, an unbuttoned shirt, no tie, and a generally sloppy appearance. If a true picture and not merely an attempt at sophisticated humor (which, after all, is the author's province), it does seem that the proper authorities at M.I.T. could issue some rules of guidance: "Just thought that I would drop you a line to tell you that I had a fine card from my roommate Billy Wood out in California with a change of address. No news from him aside from card. He probably has sent you the address, but here it is anyhow: 5800 Sacramento Avenue, Richmond, Calif.

"By any chance has the column on 'Accent on Living,' page 102 of the December *Atlantic*, been called to your attention? Author is Charles W. Morton. I personally feel that his comment is 100 per cent justified and Mrs. D. feels the same! Conditions are absolutely disgraceful.

"Nothing much new with us. Personally I am wrestling with a very nasty attack of sciatic rheumatism in my right leg. Quite painful and rather crippling, but I think that the worst is over now. It may encourage us to depart for warmer climes come January 15 or so! It has been a cold December, with many mornings close to zero and little thawing at noon."

A circular letter dated December 18 from John J. Casey '40, membership committee of the M.I.T. Club of New York, tells of an arrangement for class luncheons at the club. Our Class is assigned the first Monday of each month. George Wadleigh, a member of the club, represents our Class. Anyone who may be in or around New York on the first Monday of

any month should contact George, whose telephone number is HA 5-0579. The letter follows:

"Do you know that the M.I.T. Club of New York now has nearly 2,000 members — is permanently located at the Hotel Biltmore — that it is well and pleasantly staffed with its own private bar and serves lunch and dinner each weekday to members and guests? The club has an excellent series of technical and social events, centered about its fine new club quarters. Jointly with our Long Island and Westchester affiliated groups we are running a series of events — one or more each month. Our technical program is very closely tied to the Institute, with key faculty members as speakers.

"Would you please advise your classmates of this program in your class notes. Those who have occasion to visit New York may be able to schedule the trip to include their class luncheon. A note to their class sponsor would assure a warm welcome."

We are pleased to report that John O. Collins/27, 805 Shadowlawn Drive, Westfield, N.J., son of our late permanent Secretary, has thoughtfully sent me a large number of records kept by his father for many years. We are sure there is a great amount of valuable and interesting information regarding the Class contained therein. After numerous tax matters and other pressing duties have been taken care of, we hope to have the opportunity to study these documents. The letter follows:

"I realize that it has been some time since my father passed away, but somehow or other time flies on. While going through a trunkful of books and papers, I came upon a file and some scrapbooks pertaining to the Class of '97. Dad had marked them to be sent to Mr. Worcester, but I believe he passed away some time ago. I am sending you these records by parcel post insured, for I am sure you will be interested in them and know best how to preserve them."

As of today, January 5, we still have had no word from any member of the Class stating that he or she would attend a 62d reunion (if one were held next June) nor any comment one way or another about it. Perhaps Gus Lamb and the undersigned can lunch together. — JOHN P. ILSLEY, *Secretary*, 26 Columbine Road, Milton 87, Mass.

1899

Although we were classmates, I did not get to know Phil Burgess well until 1909, when I became chief of laboratories of the Ohio State Health Department and my reports on water and sewage analysis were processed by the Division of Sanitary Engineering of which Phil was one of the sanitary engineers. Several years later Phil resigned and, with a partner, started a firm of consulting sanitary engineers in Columbus. Now, a half century later, he has retired, turning the business over to six younger men. The firm now employs a staff of around 90 people.

This past year Phil has spent much of his time traveling by car in Florida, Minnesota, and Maine. But now he is planning a cruise to Australia in June. On his way back he plans to stop in Honolulu for

a couple of months. Phil lives at the Athletic Club in Columbus, plays golf on its links, and swims in the pool. Can anyone else duplicate this athletic record? If you cannot, let me know that fact and include some facts about yourself.

Word has been received of the death of Carl S. Milliken, VII, on November 19, 1958, and of John C. Greenleaf, IV, on January 18, 1958.

Changes of address: Ralph H. Pinkham, 1401 Southeast Second Court, Fort Lauderdale, Fla.; Walter W. Wells, Clarksville Road, Princeton, N.J.

Again let me remind you that our 60th reunion comes in June. Let me know now whether you are planning to come. — BURT R. RICKARDS, *Secretary*, 349 West Emerson Street, Melrose 76, Mass. PERCY W. WITHERELL, *Assistant Secretary*, 84 Prince Street, Jamaica Plain, Mass.

1901

When you read these class notes you will have received the annual class letter. As I am writing this in January, I have very little information to impart. I hope that you will send in your class replies early so that I may have some material for the April notes.

I recently received from the Alumni Office notice of the death of Donald A. Kohr, V, of Dayton, Ohio, which occurred on June 14, 1958. I have no other information. Also I saw in a Boston paper in December the death of Bart Schlesinger, V, of Chestnut Hill, Mass., on December 15, 1958. You will remember that his partner Victor Sammet died last April. Bart will be missed at the reunions, as he was a regular attendant. I have heard nothing further.

The M.I.T. Club of New York is inaugurating a monthly program of class luncheons to be held at the Biltmore Hotel especially for out-of-town Alumni. A schedule has been arranged according to which the luncheon for 1901 will occur on the first Monday of every month. If any members are to be in New York on that day they will find a welcome at the luncheon.

Two of the widows of our classmates have sent substantial sums to the Alumni Fund of 1958-59. Don't neglect to send your contribution.

Sometime in April you should receive a questionnaire concerning the coming reunion in June. Will you please reply to this promptly. An interesting program is planned. Willard Dow has been spending the Christmas holidays with his daughter in California. — THEODORE H. TAFT, *Secretary*, Box 124, Jaffrey, N.H. WILLARD W. Dow, *Assistant Secretary*, 78 Elm Street, Cohasset, Mass.

1902

Through a clipping from the *Standard-Star* of New Rochelle sent in by Miss Beckler it appears that Carlton B. Allen retired at the end of 1958 as an officer of the People's Savings Bank, with which he had been affiliated for 27 and one-half years. He remains, however, as a member of the board of trustees. Allen had seen the bank's total assets grow since he had been president from approximately four

million to almost forty-eight million dollars.

The announcement of his retirement after 24 years of service as president and one year as chairman of the board was made at a dinner given by the bank officers and employees in his honor at the Wykagyl Country Club, of which he is a member. Along with his long service at the bank Allen has been active in community affairs. He was a founder of the Lions Club; has been a member of the planning board, vice-president of the chamber of commerce, a member of the board of directors of the Red Cross and other groups. He is a member of the Huguenot Lodge of Masons, the M.I.T. Club of New York, and was formerly director of the New Rochelle Yacht Club. Let us hope that in his retirement Allen withdraws a little from his activities and makes use of the travel luggage presented him at the banquet.

The following is from a release by the Public Information Office, *U.S.S. Wasp*, New York: "Boston, Mass., December 29 — Mr. Arthur L. Collier, M.I.T. Alumnus and author of the book *A Family Sketch*, today presented a revised edition of his book to Capt. E. H. C. Fredericks, Commanding Officer of the *U.S.S. Wasp*, following a luncheon given by Captain and Mrs. Fredericks in the captain's stateroom aboard the Boston based carrier.

"*A Family Sketch* is a chronicle of Mr. Collier's family history. The book tells about the torpedo boat *Lang*, named after John Lang, built in 1938 at the Brooklyn Naval Shipyard. The latest edition also goes into more detail about the history of the *Wasp*. John Lang, Mr. Collier's great-grandfather, was a seaman on the *Wasp* of 1812, the second ship in a long line of *Wasps*. The present aircraft carrier *Wasp* is the seventh ship of the fleet to bear that name.

"The first edition of the book was presented to the aircraft carrier *Wasp* by Mr. Collier several years ago when Captain B. C. McCaffree was serving as commanding officer. Captain McCaffree served the *Wasp* from September of 1951 to June of 1952." — BURTON G. PHILBRICK, *Secretary*, 18 Ocean Avenue, Salem, Mass.

1903

Our congratulations are extended to John J. Nolan on the publication in a December issue of the *Chronicle-Sun* of an historical article describing the East Cambridge waterfront of the 1880's. He has portrayed with pleasing skill the life and landscape around what is now known as Charles River Basin. It was then a mud flat at low tide and a port teeming with water craft at high tide. The old Craigie Bridge with its crude drawspan and the nearby floating bathhouses is a far cry from the modern structure and the beautiful sheet of water with its fleet of M.I.T. dinghies of today.

The M.I.T. Club of New York announces a monthly program of class luncheons at the Biltmore Hotel. Classes prior to 1910 meet on the first Monday of each month. Hermon F. Bell is our class sponsor.

We are awaiting information concerning Mrs. Edna Stoddard Ramseyer, IV,

whose death on December 20, 1958, resulted from an automobile accident.

Mrs. Sophie Thayer Blunt has the distinction of becoming the 700th member of the Age Center of New England. She is the sixth generation of the Thayer family to live in the family homestead at 259 Washington Street, Braintree, Mass. Active in our class affairs and a wide variety of interests, she served for 12 years as a member of the Braintree School Committee and is still a town meeting member. She is a member of the M.I.T. Women's Association and the American Association of University Women; she is conservation chairman of the Braintree Garden Club, historian of the Braintree Historical Society, and treasurer of the American Invalid Aid Society. A widow for the last five years, she has three children, eight grandchildren, and one great-grandchild. — LEROY B. GOULD, *Secretary*, 36 Oxford Road, Newton Centre 59, Mass. AUGUSTUS H. EUSTIS, *Treasurer*, 131 State Street, Boston, Mass.

1904

Whenever old-timers in the copper refining industry meet, someone is sure to ask, "Do you know Stan Skowronski?" Stan is now retired like most of the rest of us, but we were glad to get a note from him expressing interest in our June reunion. He also reports getting a letter from John Marston's wife stating that John is practically blind now. We are all sorry to hear this.

A notice from the M.I.T. Club of New York calls attention to their present headquarters in the Hotel Biltmore, where all Alumni are welcome. Luncheons for classes from 1896 to 1909 are scheduled for Monday of the first full week in each month.

A note from E. M. Smith '06 brought some bad news as follows: "You may not have known that my brother, Preston M. Smith, M.I.T. 1904, suffered a shock in June, 1956, in Jacksonville Beach, Fla. After several months he recovered to normal health except for a paralyzed right side. This situation continued during my annual visits in February and March until the week before Christmas. Evidently a secondary occlusion occurred about December 15, for he entered into a decline which ended early Monday A.M., December 22." You will recall that Pres was our class president in student days and was very popular in the Class.

The New York Times reports the death of another classmate, but since he was with us only for graduate work few of us became well acquainted with him. Leavenworth P. Sperry came to M.I.T. after graduating from Sheffield Scientific School at Yale. He had a notable business career as director of many corporations and in recent years as president and chairman of the Scovill Manufacturing Co. of Waterbury, Conn. He took a prominent part in civic affairs and will be greatly missed in his community.

The following note came from Ralph Ingram just in time to be inserted into this edition: "Mark G. Magnuson passed away on December 10 in the hospital at Palm Beach. He succumbed after two operations. He had been in intense pain for

months. The surgeons found him full of cancer." Maggie was a popular member of the Class in student days and attended several of our reunions, including our 50th. We enjoyed seeing him there. — CARLE R. HAYWARD, *President, Acting Secretary, and Reunion Cochairman*, Room 35-304, M.I.T., Cambridge 39, Mass. EUGENE H. RUSSELL, JR., *Treasurer and Reunion Cochairman*, 82 Devonshire Street, Boston 9, Mass.

1905

It is with the greatest personal pleasure that I announce the marriage on Saturday, January 17, 1959, of Mrs. Helen Carter Marcy and our Class President Herbert W. Kenway. At the moment of this writing, they are aboard the *Britannica* somewhere on the Atlantic Ocean. They will be at home after April 15 at Valentine Park, West Newton, Mass.

A month in our new home, Hobby Knob at Center Sandwich, N.H., finds Ruth and me happier each day in our theoretical retirement, but busier than ever getting organized. The hobbies we had planned are in the background until we get the decks cleared. For much of the time the temperature has been sub-zero with almost continuous gales; but it's plenty warm and cozy inside and snow is no problem out in the sticks where they know how to handle it. Come see.

Exchange of Christmas cards has brought considerable news. Ed and Isa Barrier celebrated their golden wedding anniversary in November. Isa adds: "It makes me feel as if I should just sit in the old rocking chair and knit, but I think I will wait a while." Gene Kriegsman has been teaching engineering drawing at Boise Junior College just to keep out of retirement. Roy Allen has sold their old home in Cambridge, N.Y., which means, he admits, that they are now permanent residents of California.

I am quoting from J. Wallace Taylor's letter accompanying his beautiful Japanese Christmas card: "I took a two months' trip to Japan this year. San Francisco to Tokyo is a short one-day flight of magic. On the Islands I covered 5,000 miles, using plane, steam rail, electric rail, bus, taxi, and hiking. Business is good, everybody is working. Everywhere I was treated with courtesy and genuine friendliness. The countryside is still old Japan, but the centers of the large cities are very progressive and modern, comparing well with us and Europe. They are 95,000,000 people in a country not much larger than California. They are fortunate that they have plenty of fresh water, but they are bursting at the seams. They live simply, yes, but I saw no poverty or distress anywhere. Their literacy is 100 per cent. They have no juvenile delinquency and their divorce rate is below 2 per cent."

Al and Emily Prescott toured Europe last spring — Holland, Belgium, France, and England. One of the nicest things was a copy of *New Home* by Helen Gay Miller, which Harry Charlesworth sent with his Christmas card. If you can find it, read it and understand our feelings as we changed from an old environment into a brand new one. Thanks, Harry. We tried it on and it fits.

Herb Bailey again favored us with a copy of his annual Christmas letter to his scattered family. I think it no violation of confidence to quote it, and I do as it is so human and descriptive: "For us 1958 was full of blessings, as always bountifully given throughout our busy lives. We hope you, too, have been happy and blessed with health and work and play. Grandpa still spends much of his time at the College Ceramic Laboratory across the street as a supernumerary, helping beginners and giving a few talks on glazes. He continues on the County Civil Service Commission and Board of Education, has a Bible class, gives tests to Boy Scouts, and helps the Girl Scouts with their pottery. The University Club, Chemical Society, and Art Association supply educational entertainment. For six weeks last summer he lived with son Edgar's family in Redwood City and took work in Ceramics at San Jose State College. The strenuous schedule of three hours daily on the bus and several miles' walk was good for him, and he made many new friends and got a lot of valuable education. Best of all were the hours with the four dear grandchildren and their parents, although Edgar was away doing field geology part of the time in the rugged Coast Range north of San Francisco. Lucy's family had no real vacation, as Owen taught summer school. However, there were Scout and Church camps for the three grandchildren and Lucy taught in some summer school conferences. She is now working in the county library, which means driving over 40 miles three days a week. However, she loves the work and it's a relief from housework. We added a most delightful trained nurse from Germany to the family this year. She is a great help to all of us, as she was a governess in London and Switzerland after the war and now works only five days a week at the hospital. May the Prince of Peace bless you with an abundance of that inner serenity which no earthly conflicts can destroy, is our Christmas prayer for you."

I received a calendar showing "The Ray Hill White Hobby Shop" at Clinton, S.C., a sort of foundation set up by Ray's widow for the benefit of the Thomwell Home and School for Children. She writes: "At last it is finished and was dedicated in October, 1958. Already over 200 happy children are making excellent craft objects and are thrilled to be creating. Ray loved to see children happy; so I feel he would like this, as only children who really want to work in this shop will do so." Roy Lovejoy reports that he and Andrea returned from a visit to New Orleans early in December — three round trips in 1958, due to sickness in Andrea's family. Roy says he hasn't missed an annual trip there since 1906, but adds that the attractions of flying have not wooed him away from the Southern Railway's Crescent Limited. Bert Files is scheduled for retirement in a couple of months. Alice has been hospitalized again for several weeks and is convalescing slowly.

Sid Caine writes about his new home at Plymouth Meeting, Pa., with the statement that at the end of a year he has gotten it into shape such that he can begin to read and study. He adds that he is almost as busy with church work as before retire-

ment, but that was in the blood and I am sure is a source of enjoyment. Gib Tower asks if I read the book *Look to the Mountain*, as he is sure it depicts the locale where we live. Yes I did, and I have just reread it. I am sure Whit's wandering in search of a homesite crossed my land or very near it. We are on almost a dead line between "Casumpy" and "Coruway" (Passumpsie and Chororua). Better read the book, if you know this north country at all.

I have a very interesting (three-page) letter from Willard Simpson, which I dare not impose upon the editor at this writing; however, news for the April issue is usually very scarce, so I hope to include some of the interesting things he writes about in the next issue. Apparently Willard is well and vigorous in all ways, also Mary. George Fuller writes that he spends half of the year in Florida, the other half in Syracuse.

Other cards received were from the Spaldings (right now at Norfolk, Va.), the Babcocks, the Hadleys, Chestermans, Pooles, Fishers, Balls, McLeans, Stevensons, Gil Joslin, Hub Kenway, and Walter Eichler. In absence of news to the contrary, we can assume, I hope, that all's well. In some notes from classmates I can infer that having removed to the "sticks" I may not be able to carry on as thoroughly as in the past. On the contrary, I should have more time for personal letters, which might prod some of our erstwhile lethargic classmates to "give" more. As to reunions, efforts in recent years indicate a lack of interest in "mid-years," but we should make an effort for the 55th in 1960. You'll be hearing more about this later, but put a ring around June in your 1960 calendar. Norman Lombard's new address is 4863 Northeast Fourth Avenue, Fort Lauderdale, Fla. — FRED W. GOLDTHWAIT, *Secretary*, Box 123, Center Sandwich, N.H., GILBERT S. TOWER, *Assistant Secretary*, 35 North Main Street, Cohasset, Massachusetts.

1906

In the middle of November, when the notes for January were written, it was a temptation to end them with a "thank-you" for our Christmas cards, knowing that we could count on at least two of them! However we stifled the thought; so now, three months late and with spring just around the corner, here is that thank you, for so many beautiful and heart-warming cards, and the messages and news many of them contained. Some of the MIT cards we sent were to widows of classmates; and judging by the replies, they were really appreciated. One card we sent to Alice M. (Mrs. Malcolm) Wight, after stopping at Canaan, N.H., and Cranford, N.J., finally reached her at Venice, Fla., where she had bought a little home last spring and says she is enjoying Florida living, going north for a few months in the summer to visit the children and grandchildren. She expected to come up January 15 for a few weeks to be with her daughter, who expected her third child then, and doubtless to see her son in Cranford. Alice regrets that she has been out of touch with Malcolm's classmates and

extends a cordial invitation to drop by when when you get over on the west coast — the address is 424 Pensacola Road, Box 1262.

Some 18 years ago Stod Pulman left Wellesley Hills, where he had been head of the Babson Statistical Organization and a near neighbor of ours. Through the years since then we have exchanged notes with our cards, and I think you will agree with this extract from his this year: "As an old friend from Texas said in her note, 'We surely owe a debt of gratitude to this custom of exchanging cards and notes at Christmas, since our lives seem to grow increasingly busy and the "gentle art of letter writing" is rapidly becoming a lost art.' I am inclined to agree with her, and we do like to keep up the Christmas card and note." You might be interested, too, in a recent (1957) book by Edward R. Hewitt (90 years old) entitled *Days from 75 to 90 Years*. Stod said he had found it very interesting. It seemed a striking coincidence that the beautiful cards of the Kidders and Chases both contained the same thought: "At Christmas time we realize more than ever how much our friends . . . have meant to us," and "Christmas is the wondrous season for remembering the friendships we cherish." Isn't it so! Another of those dear friends with whom we have been exchanging notes these many years is Bill Cady, who wrote me in December that he was slowly recuperating from an operation and hoped to be back in circulation in a few weeks. I hope, Bill, that you have long since been in top form, knocking that little white pill around. The only address we have had for George Burpee is 120 Wall Street, so I asked George if he lived at 120 Wall. George says: "No, Ned, I don't live at 120 Wall, but sometimes it seems as if I do." Still a busy man. Thanks to you all for the cards, and for the compliments about these notes in so many of them — wish I could find the time to write to everyone.

Just in time for these notes comes a long letter from one of our best correspondents, Guy Ruggles, III, from Naco, Ariz. I had asked Guy if he was still active, and he says: "Yes, I am active, but I went on the retired list on January 1. Under the terms of my retirement I will have to leave Cananea, which I regret. It is my intention to locate in Arizona, where I have lived — and I include my residence of 18 and one-half years in Sonora as Arizona — since December 3, 1908. I should say that I left Arizona for other pastures twice in that time, but within a year I was back. It is a great state and still growing. Until I find a permanent location my address will be c/o Greene Cananea Copper Co., Naco, Ariz. Although retired I am a consultant for that company.

"In September as part of my vacation I attended the annual convention of the American Mining Congress in San Francisco. It was a wonderful show. Charlie Willis, III, was there and I had a chance to chat with him, also had a nice visit with Henry Mears, III, whom I had not seen since graduation. Henry very kindly came to see me at my hotel and we talked for perhaps half an hour — at any rate it was all too short. On the way to San Francisco I stopped in Phoenix for about a week and made quite a few visits to Harold Plum-

mer's ranch. I did the same thing on the return trip and see Harold (who you may remember is quite blind) quite often on similar trips. I had hoped to see Fay Libbey at the convention but he told me on his Christmas card that he couldn't make it."

In an early January letter to me Fay said he sees Henry Mears, Bob Cushman, and Bill Cady from time to time, and: "As for the 1961 reunion I am uncertain about attending. I rather doubt it at this writing. Of course I should like to and it is possible, if not probable." Guy said his next trip would be to the annual meeting in San Francisco of the American Institute of Mining, Metallurgical, and Petroleum Engineers from February 15 through 19. As a member for 50 years he had been invited to the annual banquet as a guest of honor; then "I will become a member of the Legion of Honor and I think that a pin will be given." Thanks Guy, and who else has been attending, or will, some convention?

Like Guy, Fay, Spofford, and Thorndike evidently think Arizona is up and coming, too, as the New Year's card from Carroll Farwell announces the opening of their office in Phoenix "to better serve the western United States, Mexico, and Central America on engineering for military facilities, airports, express highways, bridges, industrial plants, port and terminal works, power plants, water supply and sewerage, drainage, incinerators." All of which would imply that there is a lot of business to be had in that part of the country where Horace Greeley told young men to go.

So many Course VI men started with a telephone company immediately after graduating and stayed there until retirement — Jim Kidder, Fred Batchelder, Otto Blackwell, Herbert Dean, and Percy Tillson, to mention a few. But not only the electrical engineers did that, for Frank Benham was Course I and James Buchanan was Course III. Mrs. Buchanan has recently written me to let me know of James's death on December 14 at the Overlook Hospital in Summit, N.J., of a cerebral thrombosis. James was born in Trenton on September 8, 1883, prepared at the State Model School there, and graduated from Princeton in 1904 with a B.S. in Chemistry. He joined us junior year as a graduate student, was a member of that select group known as the Bergwerker Verein, and did his thesis on igneous contacts in mining. His address through the years was always New York City — at first the New York and New Jersey Telephone Co. at 15 Dey Street and thereafter the New York Telephone Co. in the Havemeyer Building, 974 Anderson Avenue, 104 Broad Street, and eventually 140 West Street, becoming equipment engineer and for nearly 20 years engineer of buildings and equipment, retiring in 1948. For a few years after his retirement he was a consultant for the Columbia-Presbyterian Medical Center, New York City. James was a member of the Old Guard of Summit and the Manhattan chapter of the Telephone Pioneers of America. Besides his wife, Mrs. Kate Williams Buchanan, he leaves a son, Robert W. of Summit, and three grandchildren. In her letter — which was answered at once with

an expression of sympathy from the Class — Mrs. Buchanan said: "I know he was not able to attend any of your affairs during the years, but he never lost his interest in M.I.T." As a matter of fact, I believe that many, perhaps most, wives of Tech men also have a sustained interest in M.I.T., as evidenced by their perusal of *The Review* and the class notes. And why shouldn't they, for there is a lot of meat in *The Review* articles and much of interest in all the class notes.

Future gatherings of our Class will have something lacking, for someone who has had much to do with making our reunions, Alumni days, and many other gatherings so enjoyable and successful will be missing. Alma Drayton Kidder passed away on January 17. For nearly a year Jim and Alma have known it was cancer and have met the inevitable with a sublime fortitude and faith that has won the admiration of their friends and neighbors. Jim and Alma were married in 1912 and have a son, James Norton of Winchester, and a daughter, Marsha (Mrs. William) Sanderson of West Simsbury, Conn., and five grandchildren. Having lived in Arlington for more than 30 years, Alma has been active in many worth-while community affairs: a former president of the Women's Aid Association of the Symmes Arlington Hospital, former commissioner of the Girl Scouts, corresponding secretary of the Arlington Women's Club, and active in Red Cross. A floral tribute from the Class was sent for the service at the First Baptist Church on January 21, which Marion and I and Sherman Chase attended. The filled church was indicative of the high regard which the people of Arlington and their many friends held for Alma Kidder. Jim and their children and grandchildren have the sincere and deep sympathy of us all.

Just a few address changes: Elmer D. McCain, I, is still in Frederick, Md., but is now on R.F.D. #5; Stanley Martin Udale, II, didn't stay long in California and is back at his former address in Detroit; Francis G. Baldwin, II, is still in Sarasota and you can find him at 4305 Midnite Pass Road — takes those progressive sun-bathers to use phonetic spelling, I wot! Did you know that the M.I.T. Club of New York now has nearly 2,000 members, is permanently located at the Hotel Biltmore, is well and pleasantly staffed with its own private bar, and serves lunch and dinner each weekday to members and guests? They have set up an elaborate program of class luncheons for every month. If you are interested, or when you hit the Big Town, contact the club. Speaking of clubs, did you forget your class dues? — EDWARD B. ROWE, *Secretary-Treasurer*, 11 Cushing Road, Wellesley Hills 81, Mass.

1907

In the death of our faithful Secretary and President Bryant Nichols, the Class has lost one of its most dynamic members.

It was on Friday, January 9, while having his hair cut at a local barber shop in Whitinsville that Bryant very quietly and quickly passed from this life to the next. Medical examiner attributed death to natural causes, probably a blood clot.

Your Treasurer went at once to the Nichols home at 23 Leland Road and was as helpful as possible in arranging for the funeral service, notifying the family and newspapers.

It was 17 years ago that I was instrumental in finding for Bryant a niche in the Whitin organization. He soon showed himself to be a master of detail and became an assistant to the purchasing agent. Various other duties were added; one from which he took much enjoyment was being plant librarian.

Until this past fall he had been secretary of the Whitin Male Glee Club since its organization. This group of 40 voices represented the Whitin Plant in many places in the Boston area. A part of the group sang at Bryant's funeral, a fine tribute to him.

The funeral was held at the United Presbyterian Church in Whitinsville at 2:00 P.M. on Monday, January 12. The Class was represented by Gardner Gould, Gilbert Small and Mrs. Small, your Treasurer and Mrs. Walker. A large basket of red roses on the organ console had been sent in the name of '07. Burial was in the family lot, in Central Cemetery, Randolph, Mass.

Bryant leaves his widow, Elsie Fogg Nichols, whom he married in 1909. They were planning a 50th wedding anniversary later this year. There are three sons, Bartlett of Quincy, Edward of Belmont, and Ernest of Allston; two daughters, Mrs. Esther Ryder of Framingham and Mrs. Dorothy Hatch of Boston. There are eight grandchildren and one great-grandchild.

Technology held a very important place in Bryant's life. His work as class agent in the Alumni Fund and in raising our 50-year gift was outstanding. He also served as assistant secretary of the Association of Class Secretaries. For 54 years he was a member of the national fraternity Alpha Tau Omega.

His church life was also an active one. He was a ruling elder and member of the session in the United Presbyterian Church. He also served as editor of the weekly church calendar, librarian, and officer in the men's organization.

I will endeavor to carry on as assistant secretary until our 52d reunion next June. There will never be another Bryant Nichols, so do not expect this column to be as all-inclusive as he made it for the 48 years of his secretaryship.

One of the last class duties that Bryant handled in his own effective manner was to write Mrs. Howard H. McChesney after having received word of Mac's death on December 7, 1958, from a coronary attack. You men remember Howard, I am sure. He was a regular attendant at our reunions and will be missed this year at Oyster Harbors in June. I quote from the Welsbach house organ which his daughter had sent to us: "Mac, as he was affectionately known, began his career with Welsbach in 1938 as an electrical engineer in the Engineering and Developing Department. In this capacity, he was in charge of the design and development of the first commercial Welsbach Ozonators at Whiting, Ind., and of the first laboratory ozonator. He subsequently became chief engineer and then plant superintendent in the Kitson Factory. He designed and holds

patents for several gas valves presently manufactured by Kitson. In 1953, he was transferred from Kitson to superintendent of the Philadelphia Street Lighting Division. During the past year, Mac was involved in engineering work for both the Street Lighting Division and the Construction Division."

Both Bryant and myself have corresponded for some time with our classmate Max Greenburg, who lives in Tel Aviv, Israel. Bryant wrote in search of news for '07 and I in search of Israeli stamps. Max told a bit about himself in a recent letter: "As you might know, I was connected with the British Thomson Huston Company in England and I traveled most of the time in the Middle East, when conditions at that time were very normal and interesting."

"Then conditions changed in that part of the Arab world and the General Electric Company was not interested about that part of the world. At that time Mr. Gerard Swope '95, who was at the head of G. E. Co., came to Israel; and he and his wife came here about every two years. Two such people are few. He eventually gave eight million dollars to the Technion in Israel, and two years ago at eighty-four years he passed away. This school is very much like M.I.T."

Early in December Bryant sent out reply postal cards asking for your reunion plans; I have looked through your replies which indicate 20 men seem fairly sure of coming and 14 more hope to make it. The question seems about evenly divided on having our wives at this reunion. You men who have not sent in your cards please do, so that we may get this weighty question settled.

I shall plan a class dinner at the Faculty Club sometime in April at which all the area '07 men should attend and give me some much needed advice and help as to how '07 is to proceed. — PHILIP B. WALKER, *Assistant Secretary and Treasurer*, 18 Summit Street, Whitinsville, Mass.

1908

The second dinner meeting of the 1958-59 season was held at the M.I.T. Faculty Club, Cambridge, Mass., on Wednesday, January 7, at 6:00 P.M. Bunny Ames, Bill Booth, Nick Carter, Myron Davis, Les Ellis, Miles Sampson, Joe Wattles — also Mesdames Ames, Davis, Ellis, and Wattles — were present. Regrets were received from Fred Cole, who had his leg in a cast due to the collapse of a faulty stepladder; George Freethy; Sam Hatch; Winch Heath, who had only recently returned from a Christmas vacation with his grandchildren in Florida and did not receive his card in time; Bill Medlicott, who was laid up with laryngitis; Paul Norton; and Henry Sewell.

As usual we gathered in the Cocktail Lounge and, with a little crowding and some extra chairs, managed to get around one table. While discussing our favorite topics, we brought each other up to date on class news and plans for the winter. Joe and Mrs. Wattles are taking a month's cruise in the Caribbean, while Myron and Mrs. Davis will spend several months in Spain, Portugal, and other European countries. About 6:30 P.M. we adjourned

to Private Dining Room Number One, where we enjoyed the usual bountiful dinner and forgot all about diets.

After dinner Miles Sampson showed some fine movies which he had taken during our 50th celebration last June, beginning with commencement, when we donned caps and gowns and marched in the academic procession, and concluding with Alumni Day. Then Joe Wattles showed a movie of the *Mayflower II*, showing its construction and voyage to America. There was some discussion about our 51st reunion, which will be held at Melrose Inn, Harwichport, Mass., on the Cape, June 12, 13, and 14, 1959. We will again have the Beach House for our headquarters. Make your plans to be with us.

On November 21, 1958, Jim McGowan became "director emeritus" of Campbell Soup Company after 50 years and 21 days with the company. After serving as president and then as chairman of the board, it looks as if Jim has finally retired.

Last autumn George Whittle and his wife had a seven weeks' trip to the Orient. They spent a month in Japan, 11 days in Hong Kong, and 3 days in Taiwan. They flew both ways, some 16,500 miles, plus 2,500 miles in Japan by train, auto, taxi, and steamer on the Inland Sea. George reports: "Hong Kong was fabulous, and both Japan and Taiwan were beautiful, so lush and green, and the people so friendly."

We were glad to learn that Ralph Batchelder, who was prevented by illness from being with us at Harwichport for our 50th, was able to come east last fall to visit with his daughter at her summer place at Gaylordsville, Conn. I hope he continues to feel better so he can come on for our 51st next June.

Thanks to Ray Allen '09 we had some news of Harry Webb '09. He sent a news clipping from the *Memphis Press-Scimitar* of December 12, 1958, with a picture of Harry. This was in connection with the Memphis area's Chickasaw Boy Scout Council meeting and the award of Silver Beavers. Harry is the only survivor of the six who received the original Silver Beavers in 1931. Ray wrote: "I thought you might be interested in this clipping regarding Harry Webb. I see very little of him because for years he has been manager of a large summer colony at Mont-eagle, Tenn.—power house, pumping station, fire department, and so forth—and has been living there up in the mountains practically all of the time. The last I heard of them he and Ella were doing fine."

Last fall Harold Osborne received a special award from Engineers Joint Council expressing their appreciation of his work in association with them during the past 10 years. The citation is somewhat lengthy but includes this statement: "Engineers Joint Council is greatly indebted to Harold Osborne for his skillful and patient leadership of the exploratory group on unity of the engineering profession." Following this statement the Council expresses appreciation of Harold's subsequent work as chairman of the E.J.C. committee on constitution and bylaws consummating provisions for the expansion of E.J.C. and for its incorporation.

Have you done your duty to the Alumni Fund? You do not have to give a lot, but give something. H.A.S.N.? — H. LESTON CARTER, *Secretary*, 14 Roslyn Road, Waban 68, Mass. LESLIE B. ELLIS, *Treasurer and Assistant Secretary*, 230 Melrose Street, Melrose 76, Mass.

1909

The Class will probably be interested in the replies which have been received relative to the 50th reunion anniversary up to January 15, the time at which these notes are due at the Review Office. Replies continue to come, so the number received may be slightly different by the time you read this. There have been 70 replies. Of these 25 want to attend and will plan to be there; 26 cannot make any promises at at this time but hope to be able to attend; 19 can see now that they shall be unable to attend.

As no provision was made in the original information sheet to designate the wives and other members of the family coming, the foregoing numbers apply to class members only. On the next sheet, which should be received not long after this Review is issued, there will be opportunity to indicate the wives and others who plan to come. Fifty-eight checks have been received, making a total of \$350.00, which should more than take care of all reunion expenses. As stated in the February notes, several contributed more than the \$5.00 requested. The majority of those unable to come contributed to the fund. The committee appreciates the generous response which the Class has made.

J. N. Stephenson (Steve), X, sent us a note stating that Edward E. Wells, X, has moved to 110 St. John's Road, Point Claire, Quebec. His former address was Vancouver, British Columbia. Earlier we reported that Steve was a recipient of the Silver Acorn, the Boy Scouts' highest award. A clipping from the Scouts' magazine shows Steve receiving the award from Jackson Dodds, Deputy Chief Scout for Canada.

Steve, who is one of our best correspondents, also sent us a long obituary of Dr. Charles Camsell, XII, from the *Ottawa Journal* of December 20, 1958, entitled "Son of the North, Dr. Camsell, Dies." He was 82 years old. It would require too much space to do credit to his distinguished career. When he retired in 1946, he was deputy minister of mines and resources for Canada, and was referred to as "one of the 10 most distinguished living Canadians." He was born and raised on the northern frontier at an old Hudson's Bay Company post. He graduated from St. John's College, Winnipeg. He then headed north and worked as a lumberman, boatman, guide, dogsled mailman, and school teacher in the Mackenzie River country. He participated in the Yukon gold rush, enduring much hardship and at times living on rabbits, porcupines, and fish. He then spent much time exploring Canada's frozen north, making a geological survey for the Dominion Government. Many of the present mining developments in northern Canada are due to his efforts. He took postgraduate courses at Queens College, Harvard University, and M.I.T., where he was assigned

to our Class. He received many honors, being awarded the Murchison Grant by the Royal Geographical Society of Great Britain, the gold medal of the Institute of Mining and Metallurgy of London, the Viscount Bennett award of the British Commonwealth. He also held many high offices in geological and mining societies. He is survived by his wife, one son, and two daughters.

John J. Casey '40 of the membership committee of the M.I.T. Club of New York has asked us secretaries to call attention to the club, which is permanently located at the Hotel Biltmore. The club has nearly 2,000 members and serves lunch and dinner each weekday to members and guests. It also has an excellent series of technical and social events. There is in addition a program of class luncheons. The club is attempting to achieve maximum participation and urges M.I.T. men to schedule their trips to New York so as to include their class luncheons. — CHESTER L. DAWES, *Secretary*, Pierce Hall, Harvard University, Cambridge 38, Mass. GEORGE E. WALLIS, *Assistant Secretary*, 185 Main Street, Wenham, Mass.

1910

Dud Clapp advised me of his coming marriage some days before, and the following is the announcement from the *Boston Herald*: "Married Saturday, December 20, at a simple home wedding were Mrs. Helen Sheldon Osborne of Cambridge and Dudley Clapp, also of Cambridge. The Reverend Dan Huntington Fenn of Wayland performed the 2 o'clock ceremony that was attended by members of the immediate families. Mrs. Clapp, daughter of the late Mr. and Mrs. Edmund W. Sheldon of Erie, Pa., was formerly married to the late Jack G. Osborne of Cambridge. Mr. and Mrs. Clapp will live at 5 Channing Street, Cambridge."

Carroll Benton's monthly report of the '10 New York luncheon is always interesting. It may carry the same names, but at least it should be a stimulation for other '10 men to attend when they are in New York, N.Y., on that Wednesday of the month: "A rather short note this time regarding the regular monthly luncheon held yesterday at the M.I.T. Club in the Biltmore Hotel. Due, I think, largely to the season of the year, we had rather a small turnout — only six, as follows: Fred Dewey, Henry Schleicher, George Magee, Ray Jacoby, Gordon Holbrook, and Yours Truly."

In my last class notes I mentioned the probability of Harold Akerly visiting me during the Christmas holidays. He did and told me that he was going to New York, N.Y., as a consultant to the New York City School Department for three months. He was most modest. The following is from the *New York Herald Tribune* of January 10: "School Probe Job Given to Akerly. Dr. Henry T. Heald, President of the Ford Foundation and Chairman of State Commissioner of Education James E. Allen Jr.'s investigation into charges of \$100,000,000 waste in city school construction, appointed yesterday a staff director for the study. He is Harold E. Akerly, 71, of Rochester, N.Y. Mr.

Akerly said that he had participated in over 20 school inquiries of one kind or another. In 1942 and 1943, he was a member of the study committees headed by Dr. George D. Strayer which investigated the finances of the New York City school system and the organization and financing of the board of higher education. The new director holds degrees in architecture and education from the University of Rochester and Massachusetts Institute of Technology. Mr. Akerly, who said that he would be 'responsible for the report' of the Heald committee, declared that the inquiry and report would be completed before April 1."

On January 11, 1959, a boy was born. His mother is a daughter of your Secretary's daughter, making your Secretary a great-grandfather. I am thinking seriously of buying a cane. My great-grandson's name is Robert T. Moss. — HERBERT S. CLEVERDON, *Secretary*, 120 Tremont Street, Boston 8, Mass.

1911

[To members of the Class of 1911:

As this issue goes to press, news is received of Dennie's sudden passing on February 13. Complete information will be carried in the April class notes. — Editor]

Accompanying many of the Christmas greeting cards this year were many encouraging greetings which help in a get-well campaign — for example, Jim Duffy, VI, from the Windy City: "Keep up your courage; I have a client who had a coronary at 58 and he is now 92." Or Bob Morse, VI, from Summit, N.J.: "Just because other fellows have coronaries is no reason for you to have one; hope you are making as full and complete a recovery as I did." Paul Kellogg, IX, wrote from Montreal: "I think we would be surprised if we tabulated the cases of heart trouble in our Class. I had a little trouble a few years ago and it is still with me; but I keep going with 'shots' about every 10 days, and in general I feel pretty good."

Sorry to learn of the death on November 9, 1958, of Dr. Charles Aldon Magoon, VII, a postgraduate student who became an interested member of 1911. He died at a hospital in Mesa, Ariz., where he had lived with his wife since his retirement as a research bacteriologist seven years ago. A native of St. Albans, Vt., he received his A.B. degree at Bates College in Lewiston, Maine. His postgraduate work was done with us at M.I.T., also at the University of Minnesota and American University, Washington, D.C., where he took his Ph.D. degree.

Dr. Magoon taught bacteriology for five years at Washington State College, Pullman, Wash., and then followed government service of more than 30 years with the Department of Agriculture in Washington, D.C. He did considerable work in the early stages of frozen food investigation and in standardizing canning procedures. During World War II he was in charge of co-ordinating work of East and West Coast laboratories dealing with food compression, carried on with the aim of saving vital shipping space. At the time of his retirement in 1951, he was assistant to the chief research administrator of the Department of Agriculture.

He was a member of the First Congregational Church at Tempe, Ariz.; Phi Beta Kappa; American Association for the Advancement of Science; the Cosmos Club of Washington, D.C.; the National Horticultural Society; the Arizona Archaeological Society; the Arizona Historical Society; the Mesa Art League; the National Association of Retired Civil Service Employees; and the Arizona Artists Guild. His interest in art arose after he came to Mesa to make his home. Survivors include his wife, Mrs. Ella R. Magoon, 533 West First Street, Mesa, Ariz.; and a niece, Mrs. A. W. Williams.

Once again Paul and Ottilie Cushman issued a letter-form Christmas greeting from their home in Oklahoma City. In an accompanying note, Paul wrote: "Bill Warner, I, and I spent an enjoyable afternoon together last spring. I called him up at Nowata and met him at his office a few minutes later. After reporting home for a few minutes, we drove over to Bartlesville, where I was attending a Masonic convention as a delegate. We drove all around Bartlesville, a real oil boom city and growing fast. We also went to Wolaroc Park and saw many buffalo and deer. We enjoyed dinner together. Bill seems just the same as ever to me — erect, enthusiastic, and on the hustle."

"The M.I.T. group in Oklahoma City had a dinner in mid-December (at the new Western Electric Company's expense) at the Sportsman's Club and then went across the street to the new pilot plant, which has been operating a little over a year and which in another couple of years will move to a new plant on the west edge of Oklahoma City. Some of us rode over to Tulsa in October for a dinner meeting of The M.I.T. Club of Oklahoma, hearing Professor Peter S. Eagleson '56 of the M.I.T. Civil Engineering Department."

Joe Aaron, VI, who has been associated with a prominent Boston certified public accountant for a number of years, writes that he has been on retirement since October 1, adding: "I have been trying to get some light work, but nobody seems to want a man over 70. Had a complete checkup lately and due to a slight trace of diabetes have to be on a strict diet. Still living at 17 Green Street, Brooklyn 46, Mass." Another Boston bit: in the *Boston Globe* of December 15 a picture of President Carl Ell, XI, of Northeastern University, presenting a certificate to retiring Colonel M. D. Harris, who was ending 30 years' Army service and who had built up N.U.'s Reserve Officers Training Corps into the largest such unit in the country during the last five years.

Oberlin Clark, II, happy in semi-retirement at 50 Leonard Road, North Weymouth 91, Mass., following the sale of his business, Nelson Cement Stone Company, Inc., East Braintree, last year, writes: "The December Review came today and both Alma and I turned immediately to the class notes. It seems I get much more out of them than I put in. The new owner of my business has increased it substantially both in volume and in profit. I am putting in about six hours a day, three or four days a week, and shall be happy to continue doing so. I do drawing that is needed and some of the estimating, as well as advising on technical matters."

As Chester would say: "Guess that's all for now, Mr. Dillon." Remember, classmates, there is that need to "Write to Dennie" to insure longer and newswier class notes. You of 1911 have always done well in this respect, and please keep it up!

One address change to close this batch of notes: Samuel M. Schmidt, VII, c/o M. Sivitz, 3931 Dickson Avenue, Cincinnati 29, Ohio. And so to all of you a Happy St. Patrick's Day and don't forget to "Write to Dennie!" — ORVILLE B. DENISON, *Secretary*, Wellsweep, Box 11, Cornish, Maine. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford 55, Mass.

1912

The untimely death of Fred Barker will, I know, be a shock to you all. "Frederick W. Barker, 6 Brattle Road, President of Syracuse Savings Bank and for years an outstanding figure in the business, cultural, and civic life of Syracuse, died December 10, 1958, in Doctors' Hospital, New York City, shortly after he was stricken with a cerebral hemorrhage. He was 69.

"He had flown to New York yesterday afternoon on a business trip with his wife, Mildred Tefft Barker. On the way to the Hotel Berkshire, he was taken ill in a taxi. A physician treated him at the hotel and ordered him moved to the hospital."

"Mr. Barker suffered a coronary thrombosis July 8. He had been working part time at the bank since then. Friends said he appeared in excellent health the last few days."

"Mr. Barker had been particularly active recently in connection with the dedication of carillon chimes at the bank. Upon word of his death, the chimes were stilled last night and will remain so until after the funeral."

"A native Syracusan and son of Frederick W. and Adelaide King Barker, Mr. Barker was bent on a career as a chemical engineer. He attended the public schools of the city and was graduated from Massachusetts Institute of Technology in 1912 with the degree of bachelor of science in chemical engineering. Following graduation he went with Allied Chemical and Dye Corp. and remained with this firm 10 years, then switched to Kaumagraph Co. of New York City."

"Mr. Barker served on countless committees and devoted untold hours to aiding and directing various campaigns. He was a director of the Savings Banks Trust Co.; a trustee of the Savings Bank Life Insurance; and in the Savings Bank Association of New York State he was a member and former chairman of the committee on corporate securities, a member of the committee on development, and a member of the council of administration."

"He was a director of the Syracuse Community Chest and Council and was a former chairman of its fund raising campaign. He was also a director of the Community Foundation and a member of the board and treasurer of the Syracuse Friends of Chamber Music."

"At the time of his death, Mr. Barker was president of the Syracuse Home Association; treasurer of the Y.M.C.A.; treasurer and a trustee of the Oakwood

Cemetery Association; a trustee of the Fiscal Corp. of the Episcopal Diocese of Central New York; honorary secretary and a member of the Visiting Committee of the Department of Humanities for Massachusetts Institute of Technology; a member of the board of counselors to Syracuse Memorial Hospital; and a member of the advisory board of St. Joseph's Hospital.

"A man of wide interests, Mr. Barker was extremely fond of Europe. He was particularly interested in the music and history of Spain, a country he visited often. Accompanied by Mrs. Barker, he made many trips to the Continent.

"Termed a 'fair country golfer' by his opponents, he was forced to give up the game in recent years because of his health. Earlier this year he was on the links once but declared he had better give up the game for good."

Word has just reached me of the death of Leroy Matthews, Course XI, who retired several years ago to Melvin Village, N.H. He had for many years been a partner in the Pease Laboratories, New Jersey. His death last spring was shortly followed by that of Eleanor, his wife.

While in New Hampshire, Leroy was prominent in the Community Church; in the American Legion; and as a selectman of the town of Tuftonboro.

Bill Wolfe, whose retirement was noted recently, writes that retirement came after 48 years in the rubber manufacturing business — 10 with Goodyear, 13 with Seiberling, and another 25 with Goodyear, ending up as director of domestic production. Before settling down, Bill and his wife are making a South American trip to visit the seven Goodyear plants in Latin America. After that his home address will be 1104 Sixth Avenue Northwest, Delray Beach, Fla. — FREDERICK J. SHEPARD, JR., *Secretary*, 31 Chestnut Street, Boston 8, Mass. C. BOLMER VAUGHAN, *Assistant Secretary*, 455 West 34th Street, New York 1, N.Y.

1913

The 1913 "missile" never got off the ground last month. Our secretary spent a very busy five weeks at the Shopping World, Framingham, helping Jordan Marsh keep out of the red. What's happening to our 250 active members of 1913? From the comments to our monthly column, you all enjoy the meager efforts from your Scribe; but you all must have writer's cramp, for whether active or retired you do not keep us informed of your activities.

Walt Muther (to the best of our knowledge) is still teaching mathematics at Boston University with an occasional fishing trip on the side. Received a note from Louis Wright written from *R.M.S. Statendam* of the Holland-American Line en voyage to Spain and France. Louis reports he has been in touch with Arthur Carpenter and Edgar Weil in regard to the 1913 donation in 1963. Also, he states that he did not have Bill Mattson's address, which is 28 Brookdale Road, Newtonville, Mass., for the benefit of any other of you guys who wish to communicate with Bill directly. Arthur Hirst wrote a short letter as the result of his and Mrs.

H.'s enjoying the get-together Alumni Day; also he enclosed a check for his dues. Ed is in that state of semiretirement and is now serving as a consultant with the Standard Chemical Products, Inc., with whom he served for 18 years. It was great to hear from you, Ed. Do not be a stranger.

Again it is my duty to be a bearer of sad news. Our classmate Carl L. Stucklen passed away after a long illness, Sunday, November 9, 1958. He was a graduate of Dartmouth College, Class of 1911, and received his degree in architecture at M.I.T. in 1913. Carl was associated with the real estate firm of McNally and Stucklen (as a partner). He was a member of Phi Gamma Delta fraternity, the Dragon Senior Society, Brae Burn Country Club, and Boston Real Estate Board. He served as a lieutenant in the Army Signal Corps during World War I. To Carl's wife, Betridge, and brother, Ferdinand, 1913 extends its heartfelt sympathy.

We have received a clipping stating that Pop Ready's granddaughter Neva Marie Blaine was married late in the fall at Weston, Mass., to Thomas Powers Murphy of New York City. We have received letters from Larry Hart, Bill Mattson, and Charlie Thompson in regard to the Alumni Fund and especially our special fund for 1963. Let's back our hard-working committee. Start saving now, our goal is \$100,000 minimum.

Well, Jack Farwell has made the headlines again. He has retired after 29 years as president, general manager, and board chairman of Sperry Products, Inc., Danbury, Conn. He is succeeded by Frank U. Hayes as president and general manager, but Jack remains as board chairman and on a consulting basis. Jack and Jean made a quick trip to Europe last April, visiting Paris, Germany, Holland, England, as well as his old headquarters of 10 years' duration. He hopes to make another trip soon, when he has more leisure.

We have received quite an interesting letter and circular from the M.I.T. Club of New York, Inc. This club has a rather extensive program and layout with 2,000 members, is located permanently at the Hotel Biltmore with a private bar and weekly lunch and dinner for all classes on certain days. From the detailed schedule it appears that our old buddy, Eugene L. Macdonald, is the 1913 sponsor and host for the 1913 monthly luncheon meeting on Wednesday following the first Monday of each month. If you plan to be in New York at any time, why don't you communicate with Gene at Parsons, Brinckerhoff, Hall, and Macdonald, 51 Broadway, New York 6, N.Y.?

Received a postal from Louis and Edie Wright from Paris just prior to their sailing for the good old United States. They are still reminded of our 45th reunion and we believe are planning for the next one in 1961. Yes, it was very gratifying to Roz and Yours Truly to receive so many Christmas cards and to mention a few: Jo and Bill Mattson; the Brewsters; Annie and Charles Thompson; Admiral Irving McDaniel and wife Kay, Class of 1916; the Bonneys; Janet Mattson; the Stanley Davises; Nancy and Bob Peck (Hap's son), Class of 1944; Esther and Harold Rand; Julie Portal (Mrs. Robert); Ed and

Betty Cameron. By the way, you will all be glad to hear that Ed is improving daily, and he would enjoy hearing from you at Southville, Mass., which is a part of Southboro, not far from the Southville Post Office.

Well, your Correspondent, like Bill Cunningham, will next address you from Florida in February. Our mother-in-law, friend wife, and Yours Truly will leave this chilly clime on January 31 in the little Vauxhall heading for Hollywood, Fla. (not movieland), to cover the eastern coast to the tip of the peninsula and return about the first of March. We hope to call by phone or in person classmates, friends, and relatives now sojourning in southern ports. Where we stop and how long will depend on weather, moods, and other conditions too numerous to mention "Til We Meet Again." — GEORGE PHILIP CAPEN, *Secretary and Treasurer*, 60 Everett Street, Canton, Mass.

1914

Our Forty-fifth Reunion

June 12 to 14, Sturbridge, Mass.

It has been a great pleasure to receive so many notes in reply to our first 45th reunion letter. The financial response has likewise been excellent. A good attendance at the reunion now seems indicated. The unfortunate items seem to be that ill health in the family and retirement to distant places will prevent some of our classmates from attending. This is to be our last stag reunion, so all who can possibly attend should certainly do so.

Seymour Spitz has retired from the Newport Industries in New York. He has moved to Pensacola, Fla., and still does some consulting for his company. His son, M.I.T.'43, became a vice-president of the Newport Industries on January 1 and is located at their Pensacola plant. Seymour has three grandchildren.

Jerry Beard, who has been in the construction business ever since graduation days and has recently sold his construction company, the Northwestern Construction Company of Minneapolis, is retiring but continuing to live at Minneapolis. Because Mrs. Beard has developed a bad back, he doubts whether he can come east to our reunion. Many of our classmates who have written have said that they would welcome any '14 man passing their way. A new class directory will be mailed to the Class about March 1.

The winter issue of *Food Marketing in New England* contains a fine picture of Norman MacLeod as chairman of the trustees of the Eastern States Exposition. While Norm has not been heard from regarding his attendance at our reunion, he has always been a regular attendant in the past.

Harold Wilkins, another regular attendant in former years, expects that he will be unable to be present. At that time he will be attending his son's graduation from Bowdoin, where his son is currently captain of the varsity track team. The Wilkinses also have a daughter, Sally, who is a student at Cornell.

Ernest Kerr, who has retired from the presidency of the What Cheer Mutual Insurance Company, is now living in the Belleair section of Clearwater, Fla. He,

however, expects to make the trip up north to attend our reunion. A pleasant letter has been received from Clarke Atwood, who runs a sizable new hotel at Edgartown, Martha's Vineyard, Mass. He wishes we had planned to come there for our reunion; but like most of the other places we had contacted, they are already full for the season. Clarke expects to be with us at Sturbridge.

General Joe Wood writes from his home at Elizabeth City, N.C. He is now writing his second historical book, which is keeping him very busy; therefore, he expects that he will be unable to come up for the reunion. Both books have been written for the Pasquotank Historical Society and deal with the Albemarle section of North Carolina.

The *Manchester* (N.H.) *Union Leader* recently published a list of the great, i.e. those who have free passes for the state's toll roads. Our classmate Dean Fales is one of the 68 listed, holding pass #29. Dean is listed as a Toll Road Authority. Perhaps Dean will tell us more about his road testing when he attends our reunion, as he plans to do. On the quiet, Dean has joined the Bird Watchers Society and has the official insignia on his front bumper. Perhaps between the road pass and the insignia he just wants to show the bird to some of us retired slow drivers.

No reunion would be complete without Chet Ober. It is, therefore, a great pleasure to know he will be on hand. Another who writes that he will be there is Walter Eberhard, who has retired as a professor at M.I.T. but continues as a lecturer.

O. C. Clisham writes that he is still working for Gas Service, Inc., of Nashua, N.H., and has no plans for retirement. For family reasons he will not be able to attend the reunion. Vernon Tallman expects to attend the reunion, provided some public utility rate hearing does not prevent his coming. Paul Owen is looking forward to attending the reunion. [He still has Brooklyn Bridge and a few other choice pieces of real estate which could be available, particularly to you — Sec.]

Ernest Crocker is awaiting the reunion date. Although officially retired, he is still doing consulting work for the Arthur D. Little Company. Dan Hayward, who is president of Production Management Engineering Associates, Inc., of San Francisco, finds that the pressure of business together with the distance to the East will make it impossible to be with us. Lester Downing, also one of our retired classmates and one who lives just outside Boston, doubts whether conditions will permit him to attend.

Frank Ahern, who for many, many years has been traveling around the country as safety engineer for the Department of the Interior, is voluntarily retiring on March 1. He writes that he feels the time to retire is when one feels good. His son, who graduated from M.I.T., is now in Detroit working on urban redevelopment there. Frank is coming to the reunion.

Bird Duff, Director of Allegheny County Department of Works, plans to leave his very busy activities long enough to attend our reunion. Bird has just been elected president of the county and local roads division of the American Road Builders Association. R. A. Trufant, who

has deserted his cranberry farm to join U.S. Army Engineers with his headquarters at Middletown, Conn., hopes that he can take time off from his field work to be at Sturbridge with us.

Harold Bent, who recently retired as vice-president of the Newport News Shipbuilding and Dry Dock Company, writes: "Retirement is just great, and there seems to be plenty to do—in fact I don't know where I ever found the time to build ships." He is making his home at Warwick, Va., and hopes to come north for the reunion. The final decision depends on the health of Mrs. Bent, who has been receiving treatment from time to time at New York over the past eight years.

Bill McPherrin, who has been in California for quite some time, is returning for a few months to his home in Kansas City, where his company, the Kansas City Life Insurance Company, is located. About the time of our reunion he will be moving to San Mateo, Calif.; and this does not make it possible to attend our reunion. He writes that he would welcome a telephone call or a visit from any '14 classmate at his San Francisco office, which is the Hunter and Hunter Agency, 370 Sansome Street, San Francisco.

Rucker Bristow, whose home is at Dunedin, Fla., swears on a stack of bottles he is going to make the reunion in June. Rucker has been retired for several years but is still working vigorously on sweet taste orange juices and handy methods of deseeding and deskinning oranges.

Bob Moorhouse, who expects to attend the reunion, wants everyone to bring his banjo, mandolin, or what have you. We cannot afford an entertainer this time, but we certainly can put on a show of our own. Chet Davis, who was my golfmate five years ago, writes that he plans to attend. No golf has been planned, but arrangements can be made if desired. So far only two think they want to play. Five years ago the very few who played rather separated themselves from the main group of the Class.

Your Secretary is very sorry to learn from Alfred W. Devine, the Deputy Registrar of Motor Vehicles of the Commonwealth of Massachusetts, that Mrs. Devine died last summer. Mrs. Devine was known to more '14 classmates than any other wife of any '14 man. She was the former Miss Mary Sanborn, who in our undergraduate days sold us books at A. D. MacLachlan's store across from Rogers Building. She had the most pleasant disposition, in a rather trying circumstance, that most '14 men have ever known. The Devines were married on April 9, 1917. Two sons and two daughters survive her. Our sincerest sympathy is extended to Al and his children. — C. P. FISKE, *President*, Cold Spring Farm, Bath, Maine. H. B. RICHMOND, *Secretary*, 100 Memorial Drive, Cambridge 42, Mass. H. A. AFFEL, *Assistant Secretary*, R.F.D. #2, Oakland, Maine.

1915

To all my classmates, holiday greetings, with warm, friendly wishes that you and your families had an enjoyable holiday season. All the best for good health, good cheer, and good spirit in this new year.

Ray Walcott has been doing an outstanding job for our Class at the M.I.T. Club of New York. Our Class meets the first Wednesday in each month there for lunch, and Ray urges any classmate in or near New York to drop in. The M.I.T. Club of New York is permanently located at the Hotel Biltmore. It is well and pleasantly staffed with its own private bar and serves lunch and dinner each weekday to members and guests. The Club has an excellent series of technical and social events, centered about its fine new club quarters. Jointly with the Long Island and Westchester affiliated groups, the club is running a series of events. The technical program is very closely tied to the Institute, with key faculty members as speakers. Of interest to out-of-town Alumni is the monthly program of class luncheons. A regular luncheon meeting day for each Alumni class is scheduled one day a month. Those who have occasion to visit New York may be able to schedule the trip to include their class luncheon. Annual dues are only \$10.00 plus \$2.50 tax, and membership offers real advantages for the low cost. I hope that many fellows will take advantage of this.

Evers Burtner has retired from M.I.T., where for many years he has been associate professor of naval architecture. He will continue as a lecturer during the school year 1958-59. Ben Neal, completely recovered from his recent surgery, is back on the job, both in business and for our 50th fund. Here are excerpts from some of his amusing and interesting letters: "You dog! How are you coming? Holed in here for a few days and so think I will have some time to cogitate and perhaps write a few letters to some of you guys who have lost their enthusiasm. Are you so dimmed in age that no spark of youth still burns within? Where is the spirit of conquest, whose long arms and acquisitive fingers, with a kindly touch, can pick the pockets of our beloved classmates? This is not an engineering job; it is a labor of love and romance. Is there no Romeo left among us? Time so quickly moves on that we must generate energy in these old fly wheels before it is too late, and I halfway think mebbe there is a spoke gone in mine already! Anyhow, came in here yesterday, and think I have had all the doctors take a crack at me already. They will probably operate the first of the week; so from now on, expect a barrage; and I'm telling you, you'd better show some results."

Then, after Ben was sure of living, he wrote: "Well, boy, you certainly did a swell job passing the word around, and many thanks to you. I have had many notes and cards from the Class gang; and it sure was good to have them in the mail to sweeten up the rest of it, which was mostly hospital bills. Everything is still coming along well, and the difficulties are now minor. One of the nicest things that happened in the last couple of days is a pledge from Ray Stringfield, Los Angeles, for our 50th fund. Not a word from him in over a year, and then this bobs up. Isn't it amazing, and it shows a lot of the boys still have it on their minds. After all, good old Course X. If you look on page 335 of *Technique*, you will see some of the elite; and boy, would I like to crack that page,

with the exception of Reg Pollard, who has long since gone on. I wish that Boston crowd would include a check or two with their good wishes to me."

Then this fall, when Ben had completely recovered, he wrote: "One of the fascinating things about carrying on the Fund solicitation is the little news items that I get from the gang; and while it is not surprising with our age group, in one way or another everybody seems to have his problems. I am mighty sorry to hear about Ken Johnson, and will try to remember his illness, and the earliest opportunity, when I have a chance, write him a note. Ken was a close friend of Bill McEwen's, and through Bill I heard a great deal about him, but never got to know him until that meeting at Coanmessett, at which time I was much taken with him. I did know that Howard King and Chauncey Durkee had passed on, but didn't know about Fletcher. Frankly, I have been waiting to get some report from Wally Pike on the Boston crowd, to see how the direct solicitation would go, before I tried to line up other fellows by districts. While it is painfully slow, I was quite encouraged by the few returns I had on the personal letters I wrote, and I am still toying with the idea that perhaps this is the most effective way to do it; the only road block on that is the amount of time it takes to do it. By all means, give my regards to Jim Tobey, and tell him that I bet I could make the run to Concord and Lexington quicker than he could, even using the old 1925 Dodge, which I now possess. [Ben and Jim worked on the old Blue Line Sightseeing buses that used to park in front of the Hotel Brunswick.] I feel I am clicking pretty darned good; in fact, I am debating this morning whether to leave tomorrow morning for the Adirondacks on my annual hunting expedition. At the moment I think I will go, although I have got to do a bit more checking. If I go, I will be gone all of next week." From this, you will see that Ben is feeling much better and working hard again for our 50th fund.

The fun Ben gets is typified by this lovely letter from Mary Plummer Rice, writing from Mill Valley, Calif.: "Dear Ben: Your nice letter was here when I returned from a quick trip home. Sorry I'm so late, so I'm anticipating next July and sending for two years. Not that I want to miss hearing from you. Aren't you grateful to be one of the lucky ones? I've gone to the hospital twice, 15 years ago, assured I had cancer, and am still resisting the dreaded disease. I'm really a very lucky person, when I see our contemporaries. Feel about 30, and have difficulty facing the fact that sixty-five is so near. I hope to be east in 1960 for our 45th reunion. It will coincide with my young son getting a degree, the hard way, evenings, while he raises a family. Best of luck to you; keep on having good luck!"

In September, Charlie Bidwell resigned as vice-president of the Southern Berkshire Power and Electric Company, and Great Barrington, Mass., manager of that company. He had been manager there since 1925. After a long, serious illness and stay in the hospital, Ken Johnson has recovered and is back at business. Continued good health and spirit to Ken!

With the announcement of the Award of the Aladdin Lamp to Frank Scully, *Industry* carried a good-looking picture of Frank inspecting a new mobile hydraulic laboratory, which the Scully Signal Company developed for field demonstrations and development of its product for the oil industry. Frank's Ventalarm is widely used and well known in the oil industry.

I still owe you fellows that detailed account that Al Sampson wrote for us about our big class cocktail party last June. Maybe next month! Meantime, come to this year's class cocktail party on Alumni Day, June 15, at the M.I.T. Faculty Club. Al and Barbara Thomas will run it again for 1915, and what a job they do! I am glad to tell you that Al is better after his long illness and is enjoying his retirement in Beverly, Mass. The tip-off on what a good time you can expect is in Ed Sullivan's letter to Al and Anne: "My sister Anne and I want to thank you and Mrs. Sampson for a lovely cocktail party. We enjoyed every minute, but it was much too short and we did not even have a chance to thank you before we left. I hope we have another chance to get together in the very near future. We should have several reunions before the snow flies. We both send our best regards to you and your wife."

John Homan has retired and has been living for two years at 14164 West Parsley Drive, Madeira Beach, Fla. That is near Clearwater, so Fran and I hope to reunion with him and the Hiltons down there in March.

At the second big Alumni Fund conference held at M.I.T. last September, Clive Lacy, Max Woythaler, and I represented 1915 and had an inspirational visit together. I have had a few pleasant phone talks with Thayer MacBride, who has been retired for 15 years and lives in Cohasset, Mass. Unfortunately, he has been in poor health; but he certainly keeps in gay spirits. He is near the top of the grandpappy league with ten grandchildren belonging to his three married children. Chet and Margaret Runels of Lowell, Mass., probably lead the league with, oh, so many, plus a new granddaughter, Anne Morrill DeMallie, born to their daughter Mary on September 10. Time marches on! I remember Mary Runels as a little girl! Charlie Blodgett's widow, Cynthia, is living in Bangor, Maine, with her daughter Elise, who is a graduate nurse. She recently met Charlie Paine's widow, who lives there, also.

Reliable Parry Keller, always dependable for news for the notes, wrote in September from Akron: "I was glad to know that Ben Neal, who is a very nice guy, had left the hospital and was convalescing at home. I hope that he continues to make progress toward complete recovery at an accelerated rate. I have managed to live a simple form of life during August and September. I have been helping my son paint his house and work on other projects to improve his property. I feel that I have been doing something which can be classed at least as slightly productive. I am planning a holiday of a week or 10 days in the hills of West Virginia starting in October. I hope to get a lot of good color pictures there. It is always good to hear from you. All my best to you and

Fran." Then later, a colorful card came from Parry, in Oglevia Park in West Virginia, where he said he was spending a week in the lovely place taking pictures, hiking, reading, and living a good and simple life.

Larry Bailey is enjoying retirement at Elderberry Lane, South Duxbury, Mass., and writes: "Greetings from South Duxbury, Mass. After five months' part-time work with F. J. Stokes Corporation, the axe finally fell on June 1; and I am fully retired after 42 years with Stokes. We spent the summer on the Jersey shore, and moved up here on October 23, having purchased a modified Royal Barry Wills (IV '18) house. Keep me advised of any 1915 activities in the Boston area. If you or any of the old gang are in this neighborhood, drop in and see me. We are at the foot of Captains Hills on Elderberry Lane, only eight miles from Plymouth and the *Mayflower II*. P.S. I find Scully gadgets on my oil heater and on the local oil delivery truck. How is Benny Neal getting along?"

What a Class! On November 14 at the M.I.T. Faculty Club, 23 classmates and guests gathered for another "Good-Fellows-Get-Together" dinner. Present were: Bill Brackett with guest Buck Buchan, Whit Brown, Bill Campbell, Sam Eisenberg, Reggie Foster, David Hamburg, Wink Howlett, Jim Hoey (President 1943), Larry Landers, Azel Mack, Ed Maher, Hank Marion, Stanley Osborn, Chet Runels, Wally Pike, Jac Sindler, Bill Sheils, Ed Sullivan, Pop Wood, Max Woythaler with guest Lew Clements. Those listed as guests are really class members, now, for they have been attending these dinners regularly for a long time. It is particularly nice to have old classmates' families, too; Dave Hamburg, Bill Sheils, and Ed Maher, Henry Sheils's son-in-law, Doug McMurtrie wired greetings from Gorham, New Hampshire; and Wayne Bradley wired from Detroit that he was flying on for the dinner. We were disappointed that he didn't arrive, which is explained by this later letter: "Last Friday, I wired you from Detroit saying that I planned to be at the class dinner that evening. I was particularly anxious to do so, because I had missed several such occasions in the past. Unfortunately, however, I became involved in a four-car accident on White Stone Parkway in Flushing, N.Y., when a car in the westbound lane leapt the center esplanade and crashed into my car. Four automobiles were involved, and several people were hospitalized. Fortunately, I escaped injury, although my three-week-old Lincoln suffered quite a little damage. You will note that we are now located in Moosup, Conn., where we purchased a factory building last year. I hope that if you are in this vicinity you will stop in and see us. Meanwhile, say hello to any of the boys you meet."

Bur Swain, the funny man, wrote from East Orange, N.J.: "Gee! Where does the time go to? Don't retire, because you get the idea you have time galore, but you tell everybody you will give him a hand and find you have no time at all. I am very sorry to have to pass up the class dinner, but the first paragraph tells why. I am mixed up in another new 'Deal' quays in

Jersey City; not in politics, just parallel, but a new deal in transit and construction. Locally, I am getting a reputation as a wet leaf raker, also a squirrel exterminator. No snow so far. No more grandchildren, so far as I have heard; only six to date. As for my turning author to tell you about my Central American trip, well, it is something to kid myself with. I promise to think about it so that when you are hard up for notes, I may write you." Al Sampson couldn't attend because of his recent illness. George Rooney missed the first class party in his career, due to some dental extractions. This announcement was greeted with, "Why didn't he have them knocked out a long time ago?" It gives us an idea of what a tough character the old redheaded Pirate is!

Loring Hayward, always a regular attendant, missed the show and wrote: "I have delayed writing for some time, but here is the story. In January, 1957, I went into the Morton Hospital at Taunton to have varicose veins pulled in both legs. That slowed me up for the winter. In June, I went for my usual medical check-up and the doctors agreed that I should have another operation, further up, and they carved me to pieces. I was around again very soon, going out into the woods and fields as usual, but with the difference that by 8:00 P.M. every day I am ready for bed and a long night's sleep. I haven't reported to you because each day I felt that it wouldn't be too long before I was back as in old times. There is plenty of work available and I don't seem able to say no, but am learning. My program is to get all work cleaned up and then quit. Ruth is planning to do the same. Remember me to the fellows and give my one drink to some thirsty guy."

These absenteers, all usually regular attendants, with last minute cancellations from other regulars like Clive Lacy, Frank Scully, Speed Swift, Jack Dalton, and Harry Murphy (who has been ill) and Frank Murphy (reconnoitering in Florida for retirement) would have given us almost a record attendance. It was good to have Max back in circulation with us, after the lovely abdominal embroidery he is sporting from his recent operation. Long distance competitors were Whit Brown from Concord, Max and Lew Clements from Framingham, Reggie Foster and Chet Runels from Lowell, Stanley Osborn from Hartford, and the winnabs, Bill Campbell and Hank Marion, all the way from New York. Greater loyalty hath no men, and it really was wonderful to see Bill and Hank up from New York, and Stan Osborn from Hartford.

Don't look now, but our 45th reunion will be coming up in 1960, and probably will be on Cape Cod again; but we will rely on Max and Wink Howlett to key it up again for us down there, as they so efficiently have done in the past. There will be a New York class dinner at the Chemists' Club, January 30, and I will give you the details of that next month. Bur Swain is working with Larry Landers on setting this up, since Hank Marion has retired and is out of New York City.

I am sorry to have to close these notes with the sad record of the passing of several of our classmates. Howard King died in New York on September 21, and many

New York and trade papers carried glowing obituaries of Howard and the work he had done. Nelson W. Turner died October 29, in Sanbornville, N.H. Ray Walcott notified us that Norris Kimball died on December 18, in Akron, Ohio. The Class's sympathy goes out to the families of all these deceased classmates. This uses up the accumulation of all my material for our column of Class Notes. So "Help! Help!" for next month.—AZEL W. MACK, Secretary, Apartment 2-6A, 100 Memorial Drive, Cambridge 42, Mass.

1916

Looking through the Alumni Association Directory of 1958-59, we find a number of Class activities that may not be of common knowledge. Joe Barker is the 1916 class representative on the Alumni Council. Council representatives of M.I.T. clubs include: Steve Berke, Miami (by the way, Steve's new home address is 236 Beacon Street, Boston 16); Henry Shepard, Panama; and Howard Claussen, associate of the Council (term expiring in 1959). The officers of the Class of 1916 are listed as: President, Ralph Fletcher; Vice-president and Special Gifts Chairman, Joe Barker; Secretary, Harold Dodge; Treasurer, Hovey Freeman; Class Historian, Walt Binger; Class Agent, Bill Barrett. Joe Barker is one of three Alumni representatives on the Departmental Visiting Committee on Modern Languages. As for officers of M.I.T. clubs, Harmon Keyes is secretary of the Phoenix, Ariz., Club, and Al Lovenberg is secretary of the Springfield, Mass., Club. With respect to the Educational Council of the Institute, whose basic responsibility is to maintain friendly relations with local secondary schools and to interview prospective students, Harold Gray is educational counselor in Fayetteville, N.Y.; and Clint Carpenter is honorary secretary and regional chairman of the Norfolk, Va., area.

In the January 5 issue of *Electronic News*, in reference to the death of Dr. C. G. Smith of Raytheon, mention is made of the fact that in 1922, "Dr. Smith joined with Laurence K. Marshall and Vannevar Bush in organizing the American Appliance Co., renamed Raytheon in 1925." Further in reference to Vannevar Bush, an article by him entitled "Obiter Dicta ex Cathedra" appeared in the December issue of *Sports Illustrated*. This is a whimsical account of athletes as seen by one who has made his name in science and the administration of science.

Jim Evans writes of the vigorous doings of Walt Binger: "Our 'boy' Walter Binger is surely in my opinion the outstanding — at his age — athlete of 1916. These past 10 days [December, 1958] he has ridden to the hounds at: 1) The Brandywine Hunt, Pennsylvania, temperature, 22 degrees F.; 2) Rosetree Hunt, Media, Pennsylvania, temperature, 21 degrees F.; 3) Essex Hunt, Peapack, N.J., temperature 16 degrees F. Between each hunt — at his age — he drove back to New York and again to the hunt. Now the secret is out: again at his age, he will go to Ireland next spring and ride to the hounds at Limerick and Galway plus more, before he returns home about in time to go to Chatham

Bars — we hope. He probably will guess where this comes from, as my niece rides with his club at Fairfield, Conn., and she was on this trip. She is not going to Ireland, however."

We've had further word from Dina Coleman on a matter of proven interest. You may recall that last May, Henry Shepard, in writing of his hobby of rejuvenating old cars, said it was "better than wine and women." In the November issue, Dina's challenge: "Taint so and never was!" was accompanied by Henry's reply: "Dina's just putting on airs, as he has passed his prime the same as the rest of us." Now comes Part IV of the story in the form of a dignified commentary from Dina (what wouldn't we give for the undiluted pleasure of *hearing* him make it?): "Upon first reading Hen Shepard's derogatory remarks in the November issue, I first decided to maintain dignified silence. Then again, that being unlike me, I herewith offer my rebuttal. In the first place, with Ralph Fletcher around, no member of the Class with sense enough to live this long would make any claims about capacity. Hen's first statement was entirely too exclusive because wine is always a fine thing, having been recommended in the Bible and ever since by people who know. That in itself would justify its inclusion. Now as to women, any man in his right mind knows they are a joy, a pleasure, and a delight; and he doesn't need to have any low-down ideas to enjoy their company. Therefore, it reasonably follows that my first statement is true and unassailable. That is all; that is enough." Hear, hear!

In the last issue, our story of Joe Barker's trip to Europe last spring left him in Germany. We are happy to continue his account, which he furnished in answer to an earnest request: "We arrived in Holland at the very height of the tulip season — miles on miles of tulip and hyacinth blooms far as the eye could see! But the most charming sight of all is Kenkenhof — a large estate purchased by the bulb growers association with the miles of forest paths lined with the choicest blooms of each grower. Our Embassy and my Dutch friends had arranged for me to give two talks — one in Eindhoven at the new Technical University just being completed near the famous Philips Plant (the General Electric or Westinghouse of Holland) and the other in The Hague in the former summer place of the queen, now a cultural center. Of course, we visited Amsterdam, Rotterdam, Utrecht, and spent a most pleasant day seeing the vast Polders reclaimed from the North Sea by tremendous dams, dikes, and pumping stations.

"Then to Brussels and the exposition, where we spent 10 days. Again under the auspices of our Embassy, the U.S. Commissioner General and the Royal Belgian Societies of Engineers and Scientists, I spoke at the International Science Hall of the Exposition. So much has been written in the press and so many pictures published of the various buildings and exhibits, I need say little except that, being located in the royal park adjacent to one of the royal residences, it was charmingly landscaped and the buildings were laid out without destroying the wonderful trees. Our U.S. Pavilion, designed by

Stone, an M.I.T. architect, was one of the most beautiful if not *the* most beautiful at the Exposition. The 360 degree movie production, done by Walt Disney with the support of the Ford Motor Company Fund, gave the 40 million people of Europe who crowded in to see it a marvelously thrilling picture of American life and scenery. With the political crisis in France during the last weeks of May, it was decided by the Embassy that I should go along to Paris to give the final scheduled talk under the auspices of France-Etats Unis. Mary and Michael stayed in Brussels while I went down to Paris and right back again by night trains. Fortunately, we had 10 days in and around Paris before we motored down to Lisbon at the beginning of our trip, so we were not completely disappointed. Turning our car over for shipment to New York, we flew to London, Shannon, Gander, and on to Idlewild after three months of exciting experiences in western Europe." We all know Joe's assignment was well handled!

Some time ago we tried unsuccessfully to find a good replacement for a neon night light that had been of service in our upper hall for 22 years, seven or eight hours per night. That's well over 50,000 hours, and that's good! Finally, we wrote Bert Ellis, who immediately had the answer—a glow lamp that looks just like the one we had. Look forward to a report on the new lamp in 1981! Bert writes that his retirement comes on April after 42 and one-half years with the Lamp Division of General Electric. Says he, so far (November '58) he has nothing definitely planned to keep him busy for a few more years, on a part-time basis perhaps. His daughter, Martha, completed all her doctoral work last fall at Radcliffe and will receive her Ph.D. in History this spring. She is teaching history in Hollins College in Virginia. She did her undergraduate work at Wells College and received her master's at Mount Holyoke. Bert's son, David, graduated in 1956 from Case Institute of Technology in Electrical Engineering and is in Detroit with the Fisher Body Division of General Motors. Bert boasts two granddaughters. Now of course he will have time to attend all the reunions including this year's at Chatham Bars Inn, June 12, 13, and 14.

Dick Berger says that his newest publicity on cancer prevention is taking longer in its preparation than he had anticipated. Says he: "Seems that the shorter the article, the longer it takes to write it."

A quotation of something significant that was written by Bob Wilson was sent to us a little while ago. In the lower corner of the clipping is printed: "Guideposts, January, 1959." Here's the quotation: "The Work of Thy Fingers. When you find a person over-impressed with his own ability, or with the achievements of science, try asking him: 'When is man going to duplicate the human eye?' And after he thinks that over for a while, ask him how about growing it, and dozens of other complicated organs, starting with a cell of microscopic size! And the resulting organism must generate its own power, must continually synthesize dozens of complicated enzymes and hormones to make possible various life processes, and, to cap the climax, must have the

ability to reproduce itself! Such questions serve to make all of us realize anew the truth of what David said so long ago, 'When I consider Thy heavens, the work of Thy fingers, the moon and the stars, which Thou hast ordained; what is man, that Thou art mindful of him?' (Psalms 8:3,4)" (Robert E. Wilson, Chairman of the Board, Standard Oil Co., Indiana.)

Larry Knowlton, a classmate of your Secretary through grammar and high schools, retired at the end of October, 1958, from the post of executive vice-president of the Providence Gas Co., a position he had held for 10 years. He continues as a director of the company. He was with Providence Gas for 39 years, and the company notes that to a considerable degree it was through his work that the transition to natural gas was decided upon and carried out. As an officer and director of the Greater Providence Chamber of Commerce, he is active in the Downtown Business Co-ordinating Council. Under his chairmanship, a fact-finding and analysis study leading to the present master plan was virtually completed. As reported by the *Providence Sunday Journal* in November: "Mr. Knowlton has been chairman of the technical section of the American Gas Association and is a former president of the New England Gas Association. He has taken an active part in the Providence Family Welfare Society and the Rhode Island State Council of Defense, is a member of the Harvard Club of Rhode Island, the Turks' Head Club, the Providence Engineering Society, the American Society of Mechanical Engineers, and the Guild of Gas Managers of New England."

Howard Green and your Secretary participated in two different but simultaneous sessions at the annual convention of the American Statistical Association in Chicago in December. Howard was chairman of an all-afternoon session, the Census Tract Conference, which considered among other things the census tract plans for the 1960 census. Howard, who is still with the Cleveland Health Council, is, we judge, Mr. Census Tract himself; and in the corridors we heard 'Howard said this' and 'Howard said that' in a way that indicated that it should be obvious to all who Howard was. Apparently about 30 years ago he conceived and brought into being the census tracts for cities, comprising subdivisions of *fixed boundaries* as census areas. Starting off in only a very few cities under Howard's direction, the census tract concept and procedure has expanded tremendously to include most of the major cities in the country. It proved to be so effective and helpful to the Bureau of the Census that the Bureau has taken over most of the work and makes the appointments of the directors of the work in the many areas. Until fairly recently, the work was all done by a committee of the A.S.A. of which Howard has been chairman, we believe, for over 25 years. We spent some time late one evening with Howard and Mrs. Green, discussing things present and way into the past. Their son and daughter both live in Cleveland with their families—son Howard Thacher Green has a degree from Yale and his doctorate in Metallurgy from the University of Pennsylvania.

We have notices of two books published by 1916 men: 1) *Management's Stake in Research* by Maurice Holland, published September 1958, by Harper and Brothers; and 2) *Elements of Water Supply and Waste-Water Disposal* by Gordon Mas-kew Fair, Abbott and James Lawrence Professor of Engineering and Gordon McKay Professor of Sanitary Engineering, Harvard University, with coauthor John Charles Geyer, Professor of Sanitary Engineering, Johns Hopkins University, published February 1958, by John Wiley and Sons.

Concluding for this month, we bring Ralph Fletcher's reminder to you to make definite plans to attend the 43d reunion at Chatham Bars Inn, Chatham (Cape Cod), Mass., on Friday through Sunday, June 12, 13, and 14, just before the Alumni Day on Monday, June 15. Many have already stated they plan to be there. Also remember that there's a monthly 1916 luncheon in New York, so if you are in the Metropolitan area on April 9, May 7, or June 4 (the Thursday following the first Monday of the month), drop in at the M.I.T. Club of New York, Hotel Biltmore, at Grand Central Station, for lunch from 12:00 to 2:00 P.M. Please help to keep the column interesting by sending any news you may have to: HAROLD F. DODGE, Secretary, 96 Briarcliff Road, Mountain Lakes, N.J.

1917

The recently published Directory of the Alumni Association of M.I.T. for 1958-59 shows that a number of classmates have a continuing interest in Institute affairs. Topping the list is, of course, the one and only Lobby, who is both executive vice-president of the Alumni Association and publisher of *The Technology Review*. Past Presidents of the Alumni Association have been: Raymond Stevens, 1944-45; Raymond Blanchard, 1947-48; John A. Lunn, 1950-51. At the present time, John also serves as chairman of the 10 members at large of the Alumni Council. Our Class representative on the Council is our Assistant Secretary Stanley C. Dunning. Your Secretary is a member of the committee which makes nominations for members of the Departmental Visiting Committees. The following are representatives on Departmental Visiting Committees: Francis V. du Pont, Civil and Sanitary Engineering; Stanley M. Lane, Medical; Raymond Stevens, Sponsored Research. Educational Council representatives who interview prospective students and make high school contacts for the Institute are: G. Rad Stevens, Elgin, Ill., area; Theodore E. Stahl, Rock Island, Ill., area (see note on Theodore Stahl below); A. R. Brooks, Short Hills, N.J.; W. L. Dennen, Scranton, Pa.; P. N. Cristal, Milwaukee, Wis. Ray Brooks is also class agent. Walter J. Beadle is a life member of the M.I.T. Corporation. This listing plus the inclusion of Walter Whitman, Head of the Department of Chemical Engineering and Penn Brooks, Dean of the School of Industrial Management, makes a rather imposing participation in Institute affairs for members of our Class.

The regular monthly luncheon for the Class members in the New York area was

held on December 4, two days after the New York papers announced the appointment of Dr. James R. Killian as Chairman of the M.I.T. Corporation and Dr. Julius A. Stratton as President of M.I.T. Those present at the luncheon—Benjamin Levey, Richard Loengard, William A. Sullivan, A. Raymond Brooks, Edwin E. Aldrin, W. J. Littlefield, W. D. Neuberger, and C. D. Proctor—directed the Secretary to send Dr. Stratton the following letter: "We congratulate you and the Institute on your becoming President, and look forward to your administration taking cognizance of the implications of science in the Space Age. We pledge you our wholehearted support." The following letter was received from Dr. Stratton: "These brief Christmas holidays have given me a moment to catch up, and I should like now to tell you how truly I appreciated your warm letter of congratulation on behalf of the Class of 1917. As I enter onto this very difficult and also very challenging task, it is wonderfully reassuring to feel the confidence and complete support of my fellow alumni. Will you please express my sincerest thanks to those who were present at the luncheon, and my very best wishes to all for the New Year."

Dix Proctor reports the death of Robert J. Marlow on December 10 in Belleville, Ill., as follows: "Bob was sick only a couple of weeks prior to his entering the hospital on December 3. He went into a coma on the sixth. His son Thorne was flown from his post in Italy, where he is making the Army his life work. Bob had had a couple of heart attacks since his second wife died a couple of years ago. Bob retired in September after 13 years as safety director in the Air Force, in a civilian capacity. His last assignment was at Scott Air Base. While at the Institute he was known as 'Chef Miskovsky.' In 1922 he changed his name to Marlow." Dix and wife, as reported previously, left New York early in December for a three months' trip on the *S.S. President Jefferson* for the Orient, going to Bangkok.

Notice has just been received of the death on December 4, 1958, of Theodore E. Stahl, Rock Island, Ill. Theodore retired in the fall of 1957 from J. I. Case Co. in Rock Island, Ill. He was 64 years of age.

Those who knew Professor Bill McAdams will be interested in the following, which appeared in *The Tech* of November 21, 1958: "Dr. William H. McAdams, M.I.T. emeritus Professor of Chemical Engineering, last week received the Gold Medal of the French Institute of Fuels and Energy. The award was established by the French Institute 'to recognize the most distinguished achievements in the utilization of fuels and thermal energy.' It was given to Professor McAdams in tribute to 'the internationally known works of an eminent engineer from the United States.' Commenting on the award, Professor Walter G. Whitman, Head of the Department of Chemical Engineering, said: 'With single-hearted devotion Professor McAdams had studied, taught, experimented, and theorized in the field of heat transfer phenomena for over 40 years, exercising leadership in its phenomenal development from crude ap-

proximations to its present status of an applied science. As a teacher, he has inspired generations of young men with his enthusiasm and insight. Many of his students have contributed through their student research to the body of research knowledge and have then gone on to become leaders in the profession. His publications in technical journals have been outstanding.'"

Another classmate in the honor receiving category is Penn Brooks. He was awarded the honorary degree of doctor of science in commerce at the Founder's Day program at Drexel Institute of Technology on December 9, 1958. The citation reads as follows: "I have the honor to present to you as candidate for the degree of doctor of science in commerce, *honoris causa*, Edward Pennell Brooks, a native New Englander and a member of the first graduating class of the Engineering and Business Administration curriculum of the Massachusetts Institute of Technology. For services in World War I as a first lieutenant of engineers with the American Expeditionary Forces, he earned the Distinguished Service Cross. In World War II he was awarded the Medal of Freedom for his service as executive in charge of the War Production Board of the American Mission to China. After having received a broad industrial training with several other companies, he entered the employ of Sears, Roebuck, and Company in 1927. He rose rapidly through the successive posts of retail merchandise manager, district manager, supervisor of the merchandise department, and general factory manager to the vice-president in charge of factories. He was also named a director of that company and of six others in various fields of business."

"In 1951 he was chosen by his Alma Mater to assume the deanship of a new School of Industrial Management made possible by the generous gift of the Alfred P. Sloan Foundation. To this position he has brought a wealth of experience in business management; an engineering scientist's keen, analytical mind; a deep understanding of human relationships within a business organization and the responsibility of business to society; and the rare ability to develop, as a team, a superior faculty and research staff. Under his wise leadership the School of Industrial Management has assumed a commanding position in education for business management at the undergraduate, graduate, and executive levels as well as in research in management science, and established a program worthy of emulation by other schools of business administration."

Here are a few random notes: Stanley Hyde reports that he has forsaken Maine for Florida, where he and his wife can be near Mrs. Hyde's mother, who is in her 97th year. Stan is on the prowl for an activity to occupy his mind in his new surroundings. His address is P. O. Box 237, Punta Gorda, Fla. The *Cambridge Chronicle-Sun* of January 1 reports the following concerning our class president, Ray Stevens: "Elected: Raymond Stevens, President of Arthur D. Little, Inc., has been elected a regular member of the Northeastern University Corporation, ac-

cording to an announcement by President Carl S. Ell. The Northeastern Corporation provides the general direction of University policies and has among its members outstanding leaders in business, industry, and the professions."

Gus Farnsworth and Stan Dunning joined Dad Wenzell in Dedham in December for the wedding of Dad's son Alan to Miss Margaret Cutler.

For golfers who are looking forward to spring and summer games, the following is contributed: "Golf again," screamed the wife, "I think I'd drop dead if you spent a Sunday at home." "Don't talk like that," the husband soothed. "You know you can't bribe me." And for those who go for motor trips in the country, please note the following sign that appeared on a rural gasoline station: "Buzz twice for night service. Then keep your shirt on while I get my pants on."—W. I. McNEILL, *Secretary*, 107 Wood Pond Road, West Hartford 7, Conn. STANLEY C. DUNNING, *Assistant Secretary*, 21 Washington Avenue, Cambridge 40, Mass.

1918

The first few years out of college may turn out to be only superficial bubbles on top of the brew; but for those who have settled as long as we, the froth is gone, the full body and flavor apparent and unchangeable. Henry Lacey, for example, poured out his life in the Navy. That was no abandonment of his professional preparation as a civil engineer, for he sailed no ships, fired no guns, and built no submarines. It was the Bureau of Yards and Docks which used his talents; and he ended with four stripes on his sleeves, eagles on his shoulders, and "scrambled eggs" on the visor of his cap. Henry is retired now, living in Melbourne, Fla., where he has a 10-acre orange grove. Two daughters have provided three grandchildren so far. The son is doing graduate work at the Institute. Sumner Wiley is another of the brethren who elected to spend his working career with the government. His cup of glory and of woe turned out to be the Public Housing Administration in Washington where, I hear, he was once boss of the whole works, but now prefers to be architect for the Project Planning Office. Sumner has seven grandchildren—one for every day in the week.

James Sullivan chose the state, instead of the national, level and is district superintendent of the Division of Employment Security in charge of the Boston office. For 18 years he worked in the General Electric research laboratory in Lynn; when the lab went to Ohio he stayed put, going to work for the state in 1937. But he was not deceived. To think "stayed put" meant stagnation and no curiosity concerning what is east of Lynn Beach, you will have no answer to the riddle of the hops (by air) in his brew. He was in the West Indies last year, for the first time since the Navy carried him there during the first world war. In 1955 he and his wife (no children) went to Europe, covering the garnered harvests of civilization which are stored there from southern Italy to the Arctic Circle in Sweden. He says they almost learned

Swedish. (What is an Irishman doing with a Swedish accent?) The wonderful thing about this trip was acquaintances to contact in almost every country. They did Iceland on the way home. So much for a Course XV man.

Nat Krass drank deep from the Pierian Spring and then made a fortune with blue serge suits, retired, and defeats the chemicals of discontent by travel, too. A year ago he made a five-month trip reaching as far away as Ceylon. Looking beyond the mere diversion of the moment, he looked at life in Kashmir, Italy, Paris, Leningrad, Berlin, Teheran, and New York. Not being sure the world was round, he did not attempt to make the circumnavigation. Once again he saw the American who married a granddaughter of old Abdul Hamid and lives in the old summer palace on a 4,000-acre estate bordering the Bosphorus. You will recall the romance and adventure of the first visit as chronicled in this column. Most interesting this time was the power of purpose he observed in the Russian factories and schools. Even in the primary schools the pictures of the smartest students were posted. The competitive spirit was nourished from the beginning, and everywhere. Our kids twist dials on the outside of a radio. In Russia the kids master what goes on inside. By the time the boys are 12 they examine machinery as we examined it in the Engine Laboratory. The bright ones are paid to go to college. In a shirt factory Nat saw 40 women working in an assembly line. Every hour the forelady chalked up the number of shirts produced. If not up to quota, a white light flashed. If satisfactory, the light was red. (You know, this was Russia.) Production was scored every hour as we score every inning. The factory stops at lunch time. The lords of the Kremlin, holding a nation in thrall, propagandize this interval as proof that in Russia man controls the machine.

As far as deponent knoweth, Marvin Pierce is the only classmate who in the distillation of life has ever done *Time*. From 1921 to 1957 he was with McCall's Magazine, but has been "doing *Time*" since then in the Luce policy making office. He says it is delightful, as a master brewer, to be able to "look at the forest without being troubled by the operational trees." Ah, but those 17 grandchildren! Via the Wellesley newspaper comes information that Warren Scott's cup is filled to flowing over once again. The day after Thanksgiving he married Mrs. Grace Woodman of Wellesley Hills. They will live in Hartford, where he is chief of the Connecticut Sanitary Engineering Service.

Our own libation of life is serenely based among acres and acres of real trees. During the cold spell in January, for the first time in our experience we had a power failure. After all, the wind blew 50 to 70 miles an hour for two days, and the pine trees did not like that. The oil furnace had a well deserved respite while we stoked the fireplace and the wood stove. This was no hardship. What brought home how smoothly we rough it was the kerosene lamps. That's all we had for artificial light when I was a small boy on the frontier of North Dakota. It seemed so adequate then. I'm not surprised that

God's first commandment was, "Let there be light! — F. ALEXANDER MAGOUN, Secretary, Jaffery Center, N.H.

1919

A very welcome card from Ev Doten reads as follows: "You will be pleased to know that the three Michigan '19 men, Charlie Chayne, Jack Fleckenstein, and I, are all looking forward to our reunion in June. Charlie gave us a most excellent paper Tuesday night, before the Detroit M.I.T. Association. And I cleared with him on reunion. Best, Ev." Sure and I am pleased, Ev. Will be looking forward to seeing you all!

And another recruit for the reunion — Bernie Coleman pens from Los Angeles: "And now we have four grandchildren: Billy, five; Glen, three; Wendy, two and one-half; and Scott, 11 months." And then he says: "What's the date of our 40th? Evelyn and I are making plans to attend. Please let me know as soon as you can, for the reunion will be coupled with an extensive trip. Regards, Bernie." Well, we've written Bernie that the date is June 12, 13, and 14. The place: Wentworth-By-The-Sea, Portsmouth, N.H. Hope we'll see you ALL there!

And another reminder of how welcome you out-of-towners will be at our class luncheons during the year (in-towners, too). The dates March through December '59 are as follows: March 6, April 10, May 8, June 5, July 10, August 7, September 11, October 9, November 6, and December 11. The place: The M.I.T. Club of New York, located on the first floor at the Biltmore. See you!

Changes of address: Leroy P. Smith, 1060 Coronado Avenue, Coronado, Calif. How about careful of news, Leroy? Holden C. Priest, 5 Breck Avenue, Brighton 35, Mass. What's new, Holden? Roderic Bent we've heard from recently and he is in fine fettle. Mailing address: Box 863-A, Gardner, Mass.

We are very sorry to have to include the following in our news notes: Mrs. Gustave M. Weil passed away some little time ago, but we have just learned of her death. You will remember her as Ellen Williams.

AND DO SEND IN SOME NEWS! — E. R. SMOLEY, Secretary, The Lummus Company, 385 Madison Avenue, New York 17, N.Y.

1920

The few faithful friends and classmates who send Christmas and new year greetings to me and through me to the Class came through as usual. K.B. and Denise White sent a distinctive, personally designed card from France and in the French language, but it translated into Merry Christmas and Happy New Year just the same. It was mailed from St.-Germain-en-Laye. Perhaps that is where K.B. has his castle or estate. Don and Millie Maguire and Warren and Eugenia Cofren also sent greetings. The Maguires are still in Middletown, N.Y., and the Cofrens are presently at their Florida hideaway. Caroline and Bob Sumwalt sent greetings from South Carolina, and the faithful and ever friendly Chuck Reed was heard from

with the usual Cleveland suburban postmark. A card from Henry R. (Bunt) Murphy gives his present address as 1060 Amsterdam Avenue, New York 25, and notes that after nearly 40 years of working with children in Turkey, Greece, Syria, and this country, comprising white and Negro, Jew and gentile, good and delinquent youngsters, he has now taken over the directorship of a home for the aged. Bunt says he may want to suggest becoming an inmate instead of a director. His older son is located in western New York State, and the younger boy is a senior in high school.

Your Secretary started the new year right in company with Buck and Mary Clark, and can say that Buck has lost none of his youthful spirit and Mary none of her youthful charm. I was also happy to be able to extend new year greetings to Jim Gibson, Al Burke, and Pete Ryer at the Alumni Council Meeting.

Perk Bugbee's statement on the recent Chicago school fire appeared in something like 600 newspapers across the country. Perk also got the usual widespread publicity on his caution to house-holders on the hazards of Christmas tree and decoration fires. Perk now has seven grandchildren; but that doesn't seem to have slowed down his bowling arm, as he is maintaining one of the top averages in the Winchester Country Club Mixed Bowling League. There was a very good and impressive picture of Norrie Abbott in a recent edition of the *Boston Traveler*. He was shown in the center of a group of distinguished Masons. Norrie is rated #1 of the Masonic group in Rhode Island.

Ted Kendrick is now in Succasunna, N.J. Fred Fischer is in Kalamazoo, Mich. Robert R. Rowe is at 2800 Ontario Road Northwest, Washington, D.C. Lawrence Berg has moved from Melrose to Reading, Mass. Dave Kaplan may be reached at 1025 Fifth Avenue, New York City. Frank Hunt is one of the lucky ones who is spending this hard winter in sunny Florida. He is at Ft. Lauderdale, address 1528 Northeast 16th Terrace. We wonder if that is where he keeps his yacht. A card from Frank and Winnie Badger indicates that they are at the same old stand in Hollywood, Fla. — HAROLD BUGBEE, Secretary, 7 Dartmouth Street, Winchester, Mass.

1921

Preparation of notes for this March issue of *The Review* is one of the most pleasant of duties, as we have often remarked, since so many of you have kindly sent notes of greeting during the holidays, in company with Alumni of other classes. We always look forward with considerable interest and anticipation to the annual appearance of these special messages, and we are particularly appreciative of the news you include of yourself and family. Many thanks to all, including Jack and Elizabeth Barriger, Harold and Peg Bixby, Ethel and Phyllis Burckett, Phil and Edna Coffin, Hugh Darden, Chick and Maida Dubé, Bev Dudley'35, the Gef Farmers'22, Harry and Catharine Field, Munnie and Alex Hawes, Sumner and Betty Hayward, Dug and Betty Jackson, Jack and Marge Ken-

dall, Pat and Pete Korn'56, Marjorie and Jack Kriz'41 Chick and Laura Kurth, Moose LeFevre, Milicent and Joe Maxwell'10, Bob and Helen Miller, Regina and Gus Munning'22, Phil Nelles, Helier and Graciela Rodriguez, Ed Rowe'06, Ray and Helen St. Laurent, Rufe and Madeline Shaw, Gretchen and Paul Smith'51, Helen and Lem Tremaine'23, Louise and Carlton Tucker'18, Dave and India Woodbury.

The Barrigers have caught an appealing scene of the Christmas season arriving at the gateway yard of the Pittsburgh and Lake Erie—a decorated dispatcher's tower, a trainload of Christmas trees, trackhands decking out a yard signal post with a brightly beribboned wreath, and the outstretched arm of friendly greeting which is the year-round mark of distinction of all railroaders, so long as wheels roll on steel. Says Catharine Field: "Harry retired this past summer (four years early) after 32 years with the Hawaiian Electric Company." Along with our good wishes goes the hope that the Fields will leave their Paradise of the Pacific long enough to join us for the BIG 40th reunion of the Class of 1921, which coincides with the centennial of M.I.T. in 1961. Snow-covered Joshua trees in the Arizona desert are pictured on the greetings from Dave and India Woodbury, but their cheery note concludes: "The picture is an overstatement! It's 90° here most days. The house is well under way. We do intend to write you a quotable letter soon—house building is very time consuming but we love it." Their new address is 85th and Gary, Scottsdale, Ariz.

For years, the Dug Jacksons have artistically illustrated their rhymed greetings and, as you might expect, the 1921 reunion in Havana is featured in the first stanza. Also shown is the big family reunion of 14 children and grandchildren at their summer home in Maine last August and a view of their comfortable home, Tetrastemma, Harmony Hills, R.F.D. #1, Havre de Grace, Md.

Also noted for artistic and newsy greetings are the annual messages from Jack and Marge Kendall of Pasadena. The big news this year is that son Bob and his wife have a son, Thomas Robert, born last July. Older son Jack has two children, Scott and Sue. Other features of this year's greetings are two swell messages, respectively from Marge and Jack. Says she: "We are fine and enjoying life as much as ever. Jack was commander of the San Marino American Legion Post, a privilege he enjoyed and appreciated. Last April, he was chosen 'Man of the Year' by the California Moving and Storage Association. He leads a busy life with his job, which requires quite a little traveling; his many organizations; and his favorite hobby—our yard. As for me, I'm never idle. My biggest and most rewarding job is that of president of the Women's Association of Pasadena Presbyterian Church, with nearly a thousand women. That plus Goodwill, Kappa, P.E.O., and the usual household tasks keep me busy." And from Jack: "This tells much of our life as we live it. Bekins still keeps me plenty busy—to Washington, D.C., on a rate case; to Toronto to procure rights to operate into and out

of the province of Ontario; and trips to Chicago, Seattle, Portland, and Dallas for Interstate Commerce Commission cases. We're opening eastern terminals in the New York, Washington, and Atlanta areas, so I may get a chance to see you sometime in New Jersey." Many thanks for the good wishes and the invitation to visit California. We're looking forward to that promised visit to New Jersey by Jack and hope he'll bring Marge, too.

Ralph G. Barrows has moved from Cambridge to a new home on Davis Road, Marblehead, Mass. George and Muriel Owens report they have temporarily closed their Long Island home and are in Vero Beach, Fla., for the winter season. Elmer W. Campbell says his home address is now 14 Scott Street, Augusta, Maine. Michael Treshow is associated with General Atomic in Del Mar, Calif., where he can be reached at P.O. Box 1082. Addresses have been received for the following and are available from your Secretary: Tristram J. Campbell; Elmer W. Davis; Brigadier General Henry Hutchings, Jr.; Arthur L. Jackson; Professor Boris V. Korvin-Kroukovsky; Donald B. Lovis; Terry Mitchell; Elliott G. Peabody; Ralph H. Price; Edward G. Ragatz; Harvey F. Rettew; Professor Preston W. Smith; and General Patrick H. Timothy, Jr.

Welcome back to the fold to Henri P. Junod, partner of Pickands, Mather and Company, 2000 Union Commerce Building, Cleveland 14, Ohio, who has transferred his affiliation from the Class of 1923. Harry was one of the most active members of the Class of 1921 as an undergraduate and just the list of his memberships takes up a sizable part of the Technique record of those years. We hope Harry will make it possible for all of us to convey greetings in person at the Class gatherings at Alumni Day, next June 15, on campus in Cambridge. Augustus B. Kinzel, Vice-president in charge of Research, Union Carbide Corporation, has been named a member of the distinguished group of scientists who have been asked to study the scientific programs of the U.S. Department of Commerce and to recommend measures to bring them in line with science and industry progress.

It is a source of much satisfaction to know that the Class of 1921 is in the forefront of all classes in special giving to the amity fund; and we hope the current pace continues, in view of the plans for a generous gift to the Institute at the time of our BIG 40th reunion. Thanks to you and hearty congratulations to Mich Bawden, chairman of our special gifts committee, and his large group of active committeemen throughout the country. Saul M. Silverstein left in January for his second trip to Israel in two years, having been invited to return by the U.S. Overseas Mission to help promote a better understanding of management's role among leaders of government, private enterprise, and labor. Saul has previously made six trips to Europe and the Near East since 1952 for the Council of International Progress in Management. He planned to return in a month via France, Belgium, and England.

The recently published annual Directory of the Alumni Association of M.I.T.

lists many of the Class of 1921 who are active in Alumni affairs. They are mentioned here in order of their appearance in the Directory. Raymond A. St. Laurent is a member of the Executive Committee of the Association. William J. Sherry and Augustus B. Kinzel have been honored and recognized by the Association in their election as Alumni term members of the M.I.T. Corporation. Henry R. Kurth is the 1921 Class representative on the Alumni Council. Council representatives for local Alumni clubs include John W. Barriger, 3d, representing the Pittsburgh club; Garvin Bawden, Cleveland; George A. Chutter, Newark; Josiah D. Crosby, Bangor; Francis B. Kittredge, Monterrey, Mexico; Arnold C. Rood, Indianapolis. Your class officers and committee chairmen are: Raymond A. St. Laurent, President; Carole A. Clarke, Secretary-Treasurer; Edwin T. Steffian, Assistant Secretary; Edmund G. Farrand, Class Agent; Larcom Randall, Assistant Class Agent; Robert F. Miller, Photo Historian; A. Warren Norton, Chairman of 50-year gift committee; Irving D. Jakobson, Chairman of 40-year gift committee; Garvin Bawden, Chairman of special gifts committee; Melvin R. Jenney, Chairman of 40th reunion committee.

Admirals Norborne L. Rawlings and Andrew I. McKee were nominated by the Alumni Council and elected by the M.I.T. Corporation to the Visiting Committee for the Department of Naval Architecture and Marine Engineering. Similarly, Robert L. Moore serves on the Committee for Economics and Science, while Antonio H. Rodríguez is a member of the Committee on Modern Languages. Officers of various local Alumni clubs include G. Whittier Spaulding, President, M.I.T. Club of the Lehigh Valley, Bethlehem, Pa.; Antonio H. Rodríguez, Review Secretary, M.I.T. Club of Cuba, Havana; Sumner Hayward, President, and Joseph Wenick, Treasurer, M.I.T. Club of Northern New Jersey, Newark; and Palmer Scott, Vice-president, the Technology Club of New Bedford, Massachusetts.

The Educational Council of the Institute numbers among its members Samuel E. Lunden, Counselor, Los Angeles, Calif.; Raymond A. St. Laurent, Honorary Secretary, Hartford, Conn.; Edward I. Mandell, Counselor, Miami Beach, Fla.; Edmund G. Farrand, Honorary Secretary, Leesburg, Ga.; Harry P. Field, Honorary Secretary and Regional Chairman, Honolulu, Hawaii; Joseph Wenick, Counselor, Caldwell, N.J.; Carole A. Clarke, Honorary Secretary and Regional Chairman, Glen Ridge, N.J.; Edwin S. Lockwood, Honorary Secretary, North Bergen, N.J.; Sumner Hayward, Honorary Secretary, Ridgewood, N.J.; John D. Bowman, Counselor, Buffalo, N.Y.; George F. B. Owens, Counselor, Islip, N.Y.; Irving D. Jakobson, Honorary Secretary, Oyster Bay, N.Y.; Arthur W. Skilling, Counselor, New York, N.Y.; George T. Welch, Honorary Secretary, Poughkeepsie, N.Y.; Raymond A. Snow, Honorary Secretary, Raleigh, N.C.; Wallace T. Adams, Counselor, Middletown, Ohio; Simon W. Freese, Honorary Secretary, Fort Worth, Texas;

Eugene W. Rudow, Honorary Secretary, Seattle, Wash.; George W. Pollock, Counselor, Milwaukee, Wis.; Antonio H. Rodríguez, Honorary Secretary, Havana, Cuba. The Directory personnel concludes with the listing of A. Warren Norton as the past president of the Alumni Association for our 25th reunion year, 1945-46.

Again our beloved Chairman-elect of the M.I.T. Corporation and former President of Technology, Jim Killian'26, has been honored by President Eisenhower, who named him to head a new Federal Council for Science and Technology. Jim is Special Assistant to the President for Science and Technology and Chairman of the Science Advisory Committee. Sincere congratulations are tendered him on behalf of all in the Class of 1921.

In just three months from now we will gather once more during Alumni Day in Cambridge on Monday, June 15. If you have attended in the past, you'll certainly want to come again and bring your wife, children and guests to share the day's enjoyment. If you haven't experienced this annual homecoming with your old pals, try it this year and see how much fun and sheer pleasure can be packed into one day. Look for the schedule elsewhere in The Review or write your Secretaries if we can be of help. Above all, don't forget to plan your attendance at our mammoth 40th reunion just two years hence. Drop us a line and tell us what you would like to have programmed for the celebration. — CAROLE A. CLARKE, *Secretary*, Components Division, International Telephone and Telegraph Corporation, 100 Kingsland Road, Clifton, N.J. EDWIN T. STEFFIAN, *Assistant Secretary*, Edwin T. Steffian, Architect, 11 Beacon Street, Boston 8, Mass.

1922

On a sunny but chilly afternoon in January, it is easy to contemplate writing notes for next month's Review in Florida. A vote should be taken to see whether or not your Secretary should have an all-expense tour to encourage a greater degree of relaxation. This is also made easier by the splendid showing of the Class of 1922 in the report of the Alumni Fund. The number of our Class giving \$100 or more is gradually increasing. Parke Appel, our President, sends new year's greetings to you all from Old Farm Road, Dover, Mass. Abbott Johnson of Muncie, Ind., continues in the news as a leader in many local and national educational activities. Ab reports that he is feeling much better and is still thrilled with his visit by Richard Nixon in dedicating their airport as Johnson Field.

Thank you to L.F. Hickernell for his greeting as president of the American Institute of Electrical Engineers. The January issue of the *Journal of Electrical Engineering* includes a comprehensive review of engineering progress in 1958 with many glimpses into a brilliant future. This photographic record of engineering developments and achievements is important reading for all M.I.T. men. Your Secretary is grieved in declining the invitation by the Puget Sound Maritime Historical Society to the dedication of H. W. McCurdy Park on January 3 and

the accompanying luncheon. Congratulations, however, have gone to Mc. A recent issue of *Telephone News* in Philadelphia reports the promotion of Eldor J. Mink as traffic engineer. A clever cartoon on the greeting of Mary and Oscar Horovitz awards the degree of supergolfer to Oscar for his second hole-in-one. David M. Broudy announces the dissolution of the firm of Montague and Broudy, stating that he will continue the practice of law at 242 Fourth Avenue, New York 3, N.Y.

The M.I.T. Club of New York announces its permanent location in the Hotel Biltmore with private bar and lunch and dinner service. Their monthly program of class luncheons indicates our Class meeting to be on the second Tuesday. Clate Grover sends greetings to all and a clipping complimenting Dwight Van de Vate, who has been elected general manager as well as vice-president of the Gleason Works, one of Rochester's principal industrial firms. They employ about 2,000 as one of the world's largest precision machinery manufacturers.

A brochure issued by American Management Association tells of Theodore T. Miller speaking at their special conference in Chicago on February 23. Ted's subject will be "Projecting the Profitability of New Products." He is president of the Polymer Chemicals Division, W. R. Grace and Co., Clifton, N.J., and A.M.A. vice-president in charge of Marketing Division. Be sure to order Crawford H. Greenewalt's forthcoming book, *The Uncommon Man: The Individual in the Organization*. It is to be published in January, 1959, by the McGraw-Hill Book Company. The book is the third volume in the McKinsey Foundation Lecture Series sponsored by Columbia's Graduate School of Business. Also look up Greenewalt's article in *Think* for December, entitled "What Makes a Good Executive?" It is especially fine reading.

The Federal Power Commission announced in December that it had appointed C. Ford Blanchard to be chief of the Division of Finance and Statistics in the office of the chief accountant. Ford has been a member of the Commission's staff since March of 1951. He lives at 903 South Frederick Street, Arlington, Va. This news comes from Chester W. Greening of Leonia, N.J. Chet also writes that Bob Cummings is with the Sanderson-Porter Company, power specialists. Bob lives at 122 Wood Terrace in Leonia but will leave for Sweden in January. Chet also hopes to see Earl Thomas of Englewood and promises more news. The Greenings spent the holidays in Los Angeles with their son, a practicing doctor of psychology.

Your Secretary is receiving congratulations these days on his appointment as director of the Buffalo branch of the Federal Reserve Bank of New York. He promises to do his best to live up to the traditions of the Class of 1922. Thinking that some of you might want to drop a line to those who have moved, the following new addresses are listed: Dr. Walter W. Boyd, 6701 River Road, Bethesda 14, Md.; Werner Schoop, Scheideggstrasse 68, Zurich, Switzerland; Earl T. Heitschmidt, 617 West Seventh

Street, Los Angeles 17, Calif.; John J. Lane, 7301 Brennon Lane, Chevy Chase 15, Md.; Irwin J. Smith, Jr., 336 Osborne Road, Loudonville 11, N.Y.; James L. Truslow, 63 Lyall Mews, London S.W.1, England; Kenneth F. Morgan, P.O. Box 211, Balboa Island, Calif.; A. Craig Lippincott, Jr., 243 East Ninth Street, Plainfield, N.J.; Theodore S. Rader, R.D. #1, Wadsworth, Ohio; Charles C. Fulton, 3015 Rodman Street Northwest, Washington 8, D.C.; George E. Taylor, 1812 Bopp Road, St. Louis 22, Mo.; Colonel Robert S. Barr, 1364 Park Row, La Jolla, Calif.; Ernest N. May, 801 Smith's Bridge Road, Wilmington 7, Del. We extend deepest sympathy to the families of David J. Abrahams of Boston and Dr. Charles R. Barton of Forest Hills. We will miss these fine members of our Class. — WHITWORTH FERGUSON, *Secretary*, 333 Ellicott Street, Buffalo, N.Y. C. GEORGE DANDROW, *Assistant Secretary*, Johns-Manville Corporation, 22 East 40th Street, New York 16, N.Y.

1923

Our genial representative on the Alumni Council, Dave Skinner, who is also vice-president and general manager of Polaroid, had his smiling countenance in several national magazines in December and January, with his picture as big as life endorsing the Blue Cross and Blue Shield Organization. Handsome man, Dave.

We hear that Thomas H. Boyd, who resides in Clifton, N.J., is currently clerk of the vestry of his church. They are involved in plans for the celebration of the 100th anniversary, and he is very busy in connection with this celebration and with a fund raising campaign to pay for their new parish house.

A note from Bill Stewart reads as follows: "In June my bride and I, with friends and crew, were aboard our new yacht *Cordonazo* cruising in the Mediterranean. Our little ship was built in Germany, and we are bringing it home in easy stages. We have just returned home from sailing from Bremen, to Plymouth, to Madeira, and then across the North Atlantic to the Virgin Islands. We left *Cordonazo* at St. Thomas and flew home to be here (Los Angeles) for the holidays and business, and we intend to return to St. Thomas in January to cruise in the Caribbean and then start the last leg home via the Canal and up the coasts of Central America and Mexico." A note from Kenneth Kingsley indicates that they met Julia and Bill Stewart in the Caribbean when they had just sailed in from Madeira.

Joel Y. Lund is a vice-president of the Warner-Lambert Pharmaceutical Co. He currently is living in Morris Plains, N.J. A note from him reads as follows: "It is quite a change for me to be living here in New Jersey after having lived so long in the Middle West. The country is lovely. I bought an old house (over 125 years old) on 14 acres of ground, and we have had lots of fun fixing it up. It is only 10 minutes from the office and 2 minutes from the Country Club, which makes things very convenient and gets away from that long struggle back and forth to work each day."

Robert C. Sprague, Chairman of the Sprague Electric Company, was appointed board chairman of the Federal Reserve Bank of Boston on December 30, 1958.

A clipping from the *Holyoke Transcript-Telegram* of November 19, 1958, indicates that Hugh A. Corr has been appointed chief of construction for the State Department of Public Works in District Two, which includes the extended Connecticut valley from the Vermont to Connecticut borders. He was honored at a dinner meeting attended by more than 200 representatives of the state government, area contractors, and highway superintendents. Hugh Corr lives at 12 Cedar Avenue, West Springfield. Besides his wife Margaret he has a daughter, Constance, who is a 1956 graduate of Our Lady of the Elms College, Chicopee, and now a teacher in the West Springfield school system; and a son, Hugh, Jr., a graduate of the University of Massachusetts and now employed as a civil engineer for the O'Connell Construction Company.

Dr. Ernest W. Thiele, research coordinator at the Whiting Research Laboratories of Standard Oil Company (Indiana), had a colloquium in chemical engineering at M.I.T. on Thursday, December 11. He described how energy or material is transferred when a gas or liquid is passed through a bed of such solid materials as the catalysts used to produce high-octane gasoline. Dr. Thiele is one of the leading chemical engineers in the United States and has been called upon by the government on several occasions to assist on atomic energy projects. He has published nearly 20 scientific articles and has been granted about 30 patents. He currently resides at 7859 South Shore Drive, Chicago.

A note from Harold B. Gray who lives in Syracuse, Ind., indicates that he is busier than ever in his retirement. He and Mrs. Gray like to travel; and in the past few years they have been around the world, spent a couple of months in Spain, some time in Mexico and the northern part of South America, and last year it was Africa. Harold, that is living.

A note from Toby Pearson indicates that he now has his own company, the Construction Chemicals, Ltd., with head office at 88 Eglinton Avenue East, Toronto 5, Ontario, and home address at Apartment 207, 1 Rosedale Road, Toronto 5, Ontario. Toby has been with the Dewey and Almy Chemical Co. of Canada for many years, and your Secretary was a little surprised to hear this latest news. We all wish you the best of luck in your newest endeavor.

Just in case you do not know, Elliott A. Adams is no longer with the Massey Harris Corp., but has been with the J. I. Case Co. for the past couple years.

A note from Norman Weiss, who is milling engineer with the American Smelting and Refining Co. in Salt Lake City, Utah, reads as follows: "The middle of October I stopped in Montreal on my way to one of our properties in Quebec and another in Newfoundland, and called Mal Carey, who as you know, is with Aluminum Company of Canada. I had dinner with Mal and his family, and we had a very pleasant evening of reminis-

cence, since the last time we saw one another was at the 1933 reunion 25 years ago. Mal makes occasional trips to their Kittimat operation in western Canada, and he has promised to stop off and see me and Mary in Salt Lake on one or more of his future trips."

We regret having to report the death of Marshall S. Simpson, Course VII, in November, 1958. Marshall was an artist and art teacher, having taught art in Newark, Middletown, and at the Newark School of Fine and Industrial Arts. He operated the Simpson-Middleman Art Studio in Newark, N.J., with Miss Roslyn Middleman of Plainfield.

The M.I.T. Club of New York has permanently located at the Hotel Biltmore and is well and pleasantly staffed with its own private bar and serves lunch and dinner each weekday to members and guests. They also conduct a regular monthly program of class luncheons, with a regular luncheon meeting day for each Alumni class being scheduled one day a month. Jack Zimmerman at the Union Carbide Corp., 30 East 42d Street, (MU-7-8000) is the sponsor for your class luncheon for the 1958-59 season. Why not phone him the next time you are in New York and join him at the next regular luncheon at the Biltmore? The Class of 1923 luncheon meets on Tuesday following the second Monday of each month.—HERBERT L. HAYDEN, *Secretary*, E. I. du Pont de Nemours and Company, Inc., Leominster, Mass. ALBERT S. REDWAY, *Assistant Secretary*, 47 Deepwood Drive, Hamden 17, Conn.

1924

March. Then April, May, June—and on the 12th a good group will foregather at the Oyster Harbors Club on Cape Cod, a hostelry noted for its hospitality, good food, good weather; and if the weather does not live up to advance billing, who cares? It's our 35th reunion, and you can be assured it will be well worth whatever effort is needed to attend. Even if jet-propelled Cardinal's moon shots all fizzle, you'll have fun. Do try. You will have yourself a time.

So much for advance publicity. Now for the news. The most unexpected was a note from Sam Helfman. Haven't heard a peep from Sam in 35 years, and it took a visit from Hank Simonds to spark this one. Sam has been a southerner for many years now, Baton Rouge. On December 11 Hank was loading in Searsport, Maine. By the 19th he was in Mobile. From there, says Sam: "He bought a car and is driving home to the West Coast. His car was loaded with souvenirs and gifts from the Middle East and the Far East. He gave my wife a handmade mother-of-pearl inlaid wooden plate from Egypt." Sam ran out of space on the card and did not include what Hank had promised, "some dope on his work." Final word: a card from Petaluma, Calif., "got home day before Christmas."

Dave Schoenfeld has gone into business for himself, evidently in a big way since he's hired a public relations outfit. The first release is headlined: "David M. Schoenfeld Opens Consulting Engineering Practice." He will specialize in prob-

lems relating to all phases of stationary, marine and nuclear steam power plant design, engineering, construction, and project management. Dave's headquarters, by the way, are in New Canaan, Conn. Looks as though he's solved the commuting problem.

Expansion on a business note we reported previously: "Space Technology Laboratories will be directed by Lieutenant General James H. Doolittle, Chairman of the Board, after January 1, 1959. S.T.L. has the largest professional scientific and engineering staff in the nation devoted exclusively to ballistic missile and space programs."

Sorry to have to report two deaths, both in November. Arthur W. Graves had been an architect for 25 years with a firm in Clinton, Mass. He died in his office of a heart attack. Surviving are Mrs. Graves, two sons, and two daughters. In New York, James P. Huguet died. He lived in Hudson View Gardens, but there is no further information.

Evidently that word of warning about "register early or you may sleep on the beach" had its effect. By letter, by Christmas card, by telephone, people have been signing up so they won't have to get sand in their blankets. Was a time when this would have been an intriguing prospect. Guess we're getting old. Walt Gress confesses it when he wants to know if the committee will provide electric blankets for beach-sleepers.

That Amezcaga-Roig coincidence of being in Hammerfest at the same time was just that, Mike says. He had no idea Al was anywhere nearby until he read these notes many months later. They'll get a chance to catch up at reunion—both will be there, and of course Hortensia and Saro will accompany them. The Roigs' Christmas card, by the way, was a beautiful Kodachrome of the Carib Hilton. This could be the start of a campaign to hold our next reunion there.

Ed Wininger's daughter, Ruth Helen, graduates from Middlebury this June, but fortunately the dates have been properly planned. It misses reunion. The Clarke Williamsses' Christmas card had us puzzled for a long time, then we gave up. It's an intriguing photo of something. Considering Clarke's job at Brookhaven, it should be the interior of a reactor; but we suspect it's either a closeup of a cut glass dish or an aerial of a field of cabbages. The George Knights' card shows Hingham Harbor through the picture window of their newly redone house. The Knights are now year-round residents of Hingham (Mass.).

Of course the Cardinals always had trouble getting their whole tribe on one card. Now that the grandchildren are included, it gets bigger every year. Next, a 24-sheet billboard? Nevin news flashes from Old Mexico show one more grandchild and son John in uniform. He's at a Nike base in New Mexico. Two of Phil Bates's sons are at M.I.T. now: Phil Jr., a graduate student; and Brad, a senior. Their card ends: "We hope to see many of you in 1959." A trip east in June, of course, will do it.

Charlie Blake, now a North Carolinian, still loves his new home but he isn't letting it tie him down. Last fall he made

a two months' bird-banding trip to the Caymans and Swan Island, going via Costa Rica. Now he's back banding in his own yard. If it looks anything like his yard up north with nets and traps and lures of all sorts, it's a tough place for a bird to get through without picking up an anklet.

See you in June on Cape Cod.—
HENRY B. KANE, *Secretary*, Room 1-272,
M.I.T., Cambridge 39, Mass.

1925

It is our sad duty to announce the death of another classmate, William W. Scripps, who passed away on November 10, 1958, in California. No detailed information regarding his passing is available at this time.

Last month we announced the death of Frederick Winsor, Jr.; and since that time, many newspaper clippings eulogizing him have been received. As noted before, he was not only well known as an architect but he had established a fine reputation as a writer of both prose and poetry.

On a more pleasant note, a Christmas card from Japan, sent by M. Kametani, explains the fact that he was unable to make his trip to the United States in 1958 because of changes in plans made by the National Defense Agency regarding certain contracts for fighter aircraft which were to have been constructed in this country. He is hoping earnestly that new developments in the coming year will bring him to the United States.

Of general interest to all of you will be the fact that Donald G. Vaughan, Secretary of the Aetna Casualty and Surety Company, has been elected and installed as president of the American Society of Safety Engineers. In addition to this extracurricular activity, Don is also a director and former vice-president for industry of the National Safety Council.

The M.I.T. Club of New York, through its membership committee, wishes to advise all of you that it is now located permanently at the Hotel Biltmore; and that it is well and pleasantly staffed with its own private bar and serves lunch and dinner each weekday to members and guests. The club has an excellent series of technical and social events planned. There is a regular luncheon meeting for each class one day a month. The Class of 1925 meets on Wednesday following the second Monday in each month. When you are in New York, why not drop in at the club?—F. L. FOSTER, *Secretary*, Room 5-105, M.I.T., Cambridge 39, Mass.

1926

Greetings from Pigeon Cove on a crisp mid-January Sunday morning. While going over class clippings, news releases, and so forth, for the past hour we have occasionally walked to the side window to watch a sea gull. This lone gull seems to sense when we arrive for the week end and appears from nowhere with the assumption he will get fed. Early this morning I tossed him the head and trimmings of a haddock from which Ruth is making a chowder. At first, a couple of other

hungry gulls appeared; but our pet gull chased them away and has been feasting alone ever since. As I start to put the notes together, I see he has had his fill and is basking in the sun on the seawall. However, the aroma of onions, salt pork and fresh haddock coming from the kitchen is actuating my own taste buds, and it isn't even time for mid-morning coffee. There's nothing like one of Ruth's Cape Ann fish chowders made from Eddie Donovan's fresh haddock!

But let's get off the fish story and on with the class notes, for which we have a number of clippings. The recent change from a partnership to a corporation by the brokerage firm of Merrill, Lynch, Pierce, Fenner, and Smith involves two classmates. From the *Wall Street Journal* we note that George Leness becomes chairman of the executive committee and that Bill Forrester becomes a member of the new board. Congratulations to both!

While our thoughts are in the New York area, I'll pass along some information about the New York Club that I received recently from John J. Casey '40. "The M.I.T. Club of New York is permanently located at the Hotel Biltmore. It is well and pleasantly staffed with its own private bar and serves lunch and dinner each weekday to members and guests. Of interest to out-of-town Alumni is the monthly program of class luncheons. A regular luncheon meeting day for each Alumni class is scheduled one day a month. The '26 luncheon is held on Thursday of the second week of each month [a week must contain a Monday to be counted]. Those who have occasion to visit New York may be able to schedule the trip to include their class luncheon. A note to our class sponsor would assure a warm welcome. He is Larry Cumming, c/o Institute of Radio Engineers, 1 East 79th Street, New York, N.Y." I know I'll give Larry Cumming a ring if I happen to be in New York on a second Thursday at noon, and I hope all other '26 men will take advantage of this opportunity.

A note from Dick Carlisle briefs us on his activities. We quote: "Am living in Elmsford, N.Y., and working as designer and patent writer for University Loudspeakers, Inc., in White Plains. Have two married children, three cute grandchildren. Am a frustrated city planner (for reducing vulnerability of cities to nuclear attack); no one listens to my ideas, which follow those of Professor Wiener and Project East River. Younger son recently mustered out of Air Force as first lieutenant pilot. Regards to all classmates! R. W. Carlisle." And by-the-way, your class Secretary could use a lot more such notes.

Early this fall we had a clipping from an unidentified source which said that Bob Sherwood had been awarded a master's degree from Harvard. We are pleased to report that this was not true. We have word from Bob from Beaumont, Texas from which we quote: "Thanks for giving me a master's degree from Harvard. So far, I haven't done quite this well; however, I was fortunate enough to be selected to attend the Business School in the spring of this year as a member of the 33d class of the Ad-

vanced Management Program. We received a diploma for our thirteen weeks' work, but it was not a master's degree. No sons at Harvard either. Both of them are lieutenants in Uncle Sam's Air Force. Must have been another Sherwood." Thanks, Bob, for straightening us out—we've heard about the Advanced Management course, too, and know that you were kept pretty busy while taking it.

Here's a news release from Anaconda: "Clyde E. Weed, Chairman of the Board of the Anaconda Company, announced today (October 1) the following organizational changes in the company: William Wraith, Jr., M.I.T. '26, has been advanced to the newly created position of metallurgical manager of the Anaconda Co. and will direct and supervise the metallurgical operations of the company and its subsidiaries. Heretofore, Mr. Wraith has been metallurgical assistant to Mr. Russell Caples, who has been vice-president in charge of metallurgical operations." Our sincere congratulations to Bill.

That about does it for this month, but I just walked to the window and the sea gull is back at the fish carcass again. I haven't even had my mid-morning coffee; so upon winding these notes up with best wishes until April, I plan to drive over to town to a little joint that serves horrible coffee. But come lunch time and that fish chowder!—GEORGE WARREN SMITH, *General Secretary*, c/o E. I. du Pont de Nemours and Company, Inc., 140 Federal Street, Boston 10, Mass.

1927

A certificate of achievement has been awarded by Army Ordnance Missile Command to Thomas A. Knowles, President of Goodyear Aircraft Corp. Goodyear developed the Jupiter nose cone, designed production tools, and is turning out the cones in quantity.

Nathan Cohn has been appointed to the new position of vice-president—technical affairs at Leeds and Northrup Company. He has been with Leeds and Northrup since graduation, starting in technical sales, and his most recent position was manager of L. and N.'s Market Development Division. He is a fellow of the American Institute of Electrical Engineers and past president of the National Electronics Conference. Recently he returned from a trip to the Soviet Union as a part of a 13-man American automation delegation. He is a member of the M.I.T. Visiting Committee for the Library.

Major General Frederic E. Glantzberg, M.A.T.S. vice-commander, recently described the mission of the Military Air Transport Service to the Rotary Club in Savannah, Ga., where he announced that he would return there when he retires from active service about a year hence.

More important is Fritz's annual Christmas Gazette, which announces the expansion of his family to include the first grandchild, Frederic E. Glantzberg, 3d. The Gazette goes on to say that with the advent of the first grandchild Fritz has developed an increased sense of responsibilities and dignity but, so far, has successfully overcome the urge to carry a cane. (Fritz, you are one of our best

customers for news. We even heard from a New Zealand Shell man, Frank Dix, that he met you in Christchurch, N.Z.)

The Alumni Association Directory for 1958-59 lists the following members of our Class in Alumni Association work: William L. Taggart, Jr., member of the Executive Committee and chairman of the Alumni Day Committee; Dwight C. Arnold and Clarence L. A. Wynd, Alumni term members of the Corporation. These members are nominated by the Alumni Association. Dike Arnold is also former president of the organization and a current member of the Alumni Fund Board. Ralph B. Johnson is a member at large of the Council. Glenn D. Jackson is Class representative on the Council. Joseph C. Burley is Council representative of the Jacksonville M.I.T. Club and a member of the Alumni Fund Board. Richard P. Hawkins is Council representative for the Mexico City club. And Edward D. Stone is a member of the Visiting Committee for Architecture; Sam Auchincloss, for Physics; and Nathan Cohn, for Library. — J. S. HARRIS, *Secretary*, Shell Oil Company, 50 West 50th Street, New York 20, N.Y.

1928

All of our news this month concerns promotions and appointments of our able classmates. To these gentlemen our hearty congratulations and best wishes!

A news release from the Long Lines Department of American Telephone and Telegraph Company reads: "James R. Rae of 171 Riverview Avenue, Tarrytown, N.Y., has been appointed chief engineer of the Long Lines Department of American Telephone and Telegraph Company, it was announced today. The appointment is effective December 1.

"In his new position, Mr. Rae will be responsible for the Long Lines Headquarters engineering organization. Long Lines builds, operates, and maintains the interstate network of trunk circuits and other facilities that make possible nationwide and worldwide telephone communications.

"A graduate of Massachusetts Institute of Technology, Mr. Rae has been employed by Long Lines since 1929. All of his assignments have been in New York City with the exception of one year in Boston, Mass.; and most of them have been in engineering capacities. In 1951, Mr. Rae was one of the United States delegates to the Extraordinary Administrative Radio Conference held in Geneva, Switzerland. Prior to his new appointment, Mr. Rae was plant extension engineer at Long Lines Headquarters."

News items in the *Transcript-Telegram* of Holyoke, Mass., and the *News* of Springfield, Mass., both dated December 10, 1959, announce that Max I. Alimansky (VI-A) has been appointed plant manager of the Holyoke plant of General Electric Co. Max has been with G.E. since he was a student engineer in 1926. Most of his association with the company was at the Pittsfield, Mass., plant, where he began as capacitor design engineer. During his G.E. career, Max's assignments have included: manager of capacitor sales; manager of engineering; assist-

ant manager of G.E.'s Transformer and Allied Products Division; manager of engineering for the Distribution Transformer Department; general manager of the Rectified Department at Lynn, Mass.; and most recently, manager of the Lynchburg, Va., plant.

The Alimansky's have two sons: Mark is a graduate student at the Institute, and Burt is a student at Mercersburg Academy, Mercersburg, Pa.

It was announced recently in the financial pages that William J. Kirk has been appointed president of John P. Chase, Inc., Boston, investment counselors. Bill has been with the company for 26 years and was executive vice-president before his promotion. — GEORGE I. CHATFIELD, *Secretary*, 100 East 42d Street, New York 17, N.Y. WALTER J. SMITH, *Assistant Secretary*, 15 Acorn Park, Cambridge, Mass.

1929

As these notes go to press, plans for the 30th reunion are well finalized. Your committee met in mid-January and agreed upon a schedule of events, which by now you have all seen in the second mailing to all 1929 Alumni. As we have said from the start, there are to be no "must" events — informal dress. You have noticed from the second mailing that those on the "will attend" list have not changed much since reported in the February Review. We hope many of the "hopefuls" will find they can and will attend.

You will notice also that a grand attraction has been added to the week end — the inauguration of Dr. Stratton as President of the Institute. As we go to press, the exact time of this event has not been announced; but it is safe to assume it will be mid-morning of Monday, the 15th of June, previous to the traditional luncheon in the Great Court. The luncheon will be followed undoubtedly by new facilities open house and the historical cocktail party and banquet in the evening. We are, indeed, fortunate that Dr. Stratton's inauguration coincides with our 30th reunion.

A little later on, Bill Baumrucker will want to know whether you will require transportation from and to Boston, and if so, when you plan to arrive and will want to leave Bald Peak. It is hoped that we here in Boston and those who are driving to the reunion can take care of those who come in by other means of transportation. Eric Bianchi will also want to know whether you are interested in the golf tournament on Saturday in order better to plan his starting times and schedules, but more about this later. For those who wish to fish, we are assured that plenty of boats are available in Melvin Village at a very nominal fee. One- and three-day licenses are available in New Hampshire, and the fishing should be good this time of year. The boat trip on Sunday should be of particular interest to those of you who are not familiar with the lake region of New Hampshire. This is a two-hour trip — the cost is included in the registration fee.

Please return the card which will be enclosed with the second announcement of the reunion; full or part payment of

the registration fee will be appreciated early; there are prereunion expenses of course. For those of you who find it impossible to attend, any contribution you wish to make toward publicity expenses will be appreciated.

An article in the *Kalamazoo (Mich.) Gazette* in November announces the appointment of Charlie Perkins as chief engineer of the Fuller Manufacturing Company in that city. Charlie received his master's degree in 1929. He has been with Fuller since 1948. I saw Phil Lamb for a few minutes the other day, not long enough to get any news of his doings, but it was grand to see him. — FISHER HILLS, *Assistant Secretary*, 62 Whittemore Avenue, Cambridge 40, Mass.

1930

I was sorry to have missed Mel Blackwood when he dropped into my office on January 6. Mel left me a note to say that he comes to M.I.T. about once a month to do some library research and has been working at the Instrument Development Laboratory in Attleboro, Mass., for the past four months. This company develops and makes instruments for aircraft and guided missiles. There are 45 electrical and mechanical engineers on the staff, and Mel is the only chemical engineer. He notes that it is significant that chemical engineering is beginning to play a part in electronics. Mel still lives in Connecticut (week ends). He has three children: Barbara, 16; Bill, 14; and Pat, 7.

During the months of November and December, 1958, our classmate Bob Elderfield gave about 24 lectures (as a Sigma Xi National Lecturer) at a number of colleges and universities on the subject, "Australian Trees and High Blood Pressure." Bob has been professor of chemistry at the University of Michigan since 1952 and has done extensive study on alkaloids, pyridine derivatives, chemistry of explosives, chemotherapy, and cardiac drugs. He received the Presidential Certificate of Merit in 1946 and was editor of the *Treatise of Heterocyclics* (five volumes) as well as the *Journal of Organic Chemistry*.

Via the *Wellesley (Mass.) Townsman*, a weekly newspaper, we have learned that Jim Morton has been elected a member of the Board of Public Works to fill the vacancy caused by the resignation of his predecessor. Jim is vice-president of Loomis Sayles and Company, Inc., investment counselors, and has been a town meeting member since 1949. He was secretary of the job classification committee which established a system of job classifications and a salary schedule for remuneration of town employees. For the past three years he has been a member of the advisory committee and most recently has served as chairman of the subcommittee on the Public Works Department. He is a trustee of Northeastern University and Garland School.

John Worcester answered our recent letter of inquiry, and we were glad to hear from him. He is married (since 1940) and has four children — three boys and a girl — ages 7 through 16; they are all students in the American Community School, Buenos Aires. John is pres-

ident of the National Lead Company of South America in Buenos Aires; president of Metalmina S.A., Buenos Aires; director, Compania Minera Castano Viejo S.A., Buenos Aires. John offers a game of golf to any visiting classmates who happen to be in that area, but he advises all to bring their own clubs if planning to stay in the Buenos Aires area.

Did you know that the M.I.T. Club of New York now has nearly 2,000 members, is permanently located at the Hotel Biltmore, that it is well and pleasantly staffed with its own private bar and serves lunch and dinner each weekday to members and guests? The Club has an excellent series of technical and social events and the technical program is very closely tied to the Institute, with key Faculty members as speakers. Of interest to out-of-town Alumni is the Club's monthly program of class luncheons. A regular luncheon meeting day for each Alumni class is scheduled one day a month. Those of you who have occasion to visit New York may be able to schedule the trip to include your class luncheon; and a note to your class sponsor, R. A. Poisson, Riegel Textile Corporation, 260 Madison Avenue, New York City, N.Y., would assure a warm welcome. The class luncheon schedule is based upon counting the first full week of the month as that week which includes the first Monday, and the Class of 1930 meets the *third Monday of each month*. It is also interesting to note that the club has many out-of-town members and would be delighted to have more among the Alumni who visit New York with any frequency. Annual dues are only \$10.00, plus \$2.50 tax; and membership offers real advantages for the low cost, according to John J. Casey '40 of the membership committee.

In thumbing through a copy of the 1958-59 Directory of the Alumni Association, I came upon the names of several of our classmates who hold official positions as club officers, Educational Counselors, and so forth. I compiled a list of these names because I thought you might all be interested to know who these classmates are, and here is the list. (Dates in parentheses indicate the year the term expires.) Council representatives of M.I.T. clubs are: M.I.T. Club of Columbus, Allen Latham (1959); M.I.T. Club of Guatemala, Hermon Scott (1959); M.I.T. Club of Albuquerque, Myron Smith (1959). Class representative on the Alumni Council is George P. Wadsworth (1959). Associate of the Council is Gregory Smith (1959). Departmental Visiting Committee members include: Course I, Civil and Sanitary Engineering, Alfred T. Waidelich (1960); Course V, Chemistry, Joseph R. Stevens (1959) and E. Ralph Rowzee (1960); Course XVI, Aeronautical Engineering, Charles J. McCarthy (1960); Humanities, Allen Latham, Jr. (1960). Officers of M.I.T. clubs are: Akron, Ohio, James B. Holden, Treasurer; Atlanta, Ga., Alumni Association of the M.I.T., Fred N. Dickerman, President; Bridgeport, Conn., M.I.T. Club of Fairfield County, Anthony R. Savina, President; Buenos Aires, Argentina, M.I.T. Club of Buenos Aires, John Worcester, Vice-president. Educational Council of the Institute members

include: Bill Griffith, Howie Gardner, Al Bird, Lee Steffens, Fred Dickerman, I. E. Ross, Biagio D'Antoni, Wes Wedemeyer, Reg Bisson, Earl Ferguson, Dave McIntire, Dick Foster, Bill Perret, Ben Buerk, W. W. McDowell, Dick Wilson, Ralph Peters, Stan Wells, Jim Holden, Ted Riehl, Jack Bennett, George Schatz, Bob Schildknecht, Walt Smith, Hal Spaans, George Brady, and Dick Huggard.

We have the following changes of address to report: Peng Y. Chew, 953A Upper Serangoon Road, Singapore 19, Malaya; John H. Foulds, 194 Grove Avenue, Somerset, Mass.; Lawrence N. Gonzalez, 7116 Exfair Road, Bethesda 14, Md.; Claude F. Horton, 3710 Overbrook Lane, Houston 27, Texas; Edward J. Marnock, 1692 East Clifton Road Northeast, Atlanta, Ga.; Arthur B. McCullough, 3010 Filbert Street, Pennside, Reading, Pa.; Robert Sealy, Jr., 120 Beach Third Street, Far Rockaway, N.Y.; George I. F. Theriault, 1814 West Schantz, Dayton 9, Ohio; Carlton E. Vanderwarker, Ludlowe Road, New Canaan, Conn.; Benjamin Yoffe, 93 Woodlawn Street, Everett 49, Mass.

And we have the sad news to report that two of our classmates have passed away within recent months — Egerton Smith on June 9, 1958, and Norm O'Shea on November 24, 1958. Egerton had retired from the Northern Electric Company of Montreal, P.Q., Canada. At the time of his sudden death, Norm was an executive electronics engineer with the Remington Arms Corporation of Missouri, where he had worked for the past 20 years. — GEORGE P. WADSWORTH, Secretary, Room 2-285, Department of Mathematics, M.I.T., Cambridge 39, Mass. RALPH W. PETERS, Assistant Secretary, 249 Hollywood Avenue, Rochester 18, N.Y.

1931

An article in the *Springfield* (Mass.) *Union* mentions that Kendall Clark has been appointed manager of military engineering of the American Bosch Division of American Bosch Arma Corp. It says in part: "Clark, who has an extensive engineering background in the industrial field, will have charge of the engineering and development of products of military use."

Charley Crawford, an associate of the William W. Clore Agency in Phoenix, Ariz., has gone back to school. An announcement from the New England Mutual Life Insurance Company tells that Charley attended a two-week course at their offices in Boston covering the latest developments in the application of life insurance to business, estate, and family protection problems. He is a member of the National Association of Insurance Agents and the National and Arizona State Underwriters Associations.

Word has been received that Vice-Admiral Clarence E. Ekstrom is now in charge of the Sixth Fleet. Admiral Ekstrom will feel at home in the Mediterranean and Eastern Atlantic, since he spent two years there as commander of the Sixth Fleet air arm shortly before getting his present assignment.

Admiral Ekstrom also made the Jan-

uary *Reader's Digest*, "Humor in Uniform." Since some of you may not have seen it, I quote: "I was fortunate enough to meet Admiral Clarence E. Ekstrom soon after his appointment to take over from Admiral 'Cat' Brown as commander of the U. S. Sixth Fleet was announced last July. Although he was obviously rushed and this was not the right moment, I said brashly, 'Sir, I'd like to be the first correspondent to congratulate you on your new command . . . and also the first to have an interview with you.' The admiral held out his hand. 'You are,' he said. 'And you just had it.'"

Tom Fearnside, chief mechanical engineer of Stone and Webster Engineering Corporation, has been elected a fellow of the American Society of Mechanical Engineers. He is also a member of the National Society of Professional Engineers and is licensed in Massachusetts, Michigan, New Hampshire, and New York. Prior to joining Stone and Webster Engineering in 1940, he was associated with International Silver Co., Meriden, Conn.; Johns-Manville Sales Corp. in Boston; and Babcock and Wilcox in New York.

Dr. Jim Fisk was in the news again recently when he was elected president of Bell Telephone Laboratories. According to an article in the *Boston Herald*, he also received an honorary doctor of science degree from Williams College last fall.

Word from the Institute tells that Ken Germeshausen presented a paper at the Inventions and Patents session of the 1958 Northeast Electronics Research and Engineering Meeting in Boston on November 19 and 20, 1958. The same source advised that Stew Knapp was mentioned in the November 3, 1958, issue of *Chemical Engineering*, as a member of a panel on "Modernization, Why and When."

Tin Rucker was also mentioned in a recent release from Tech. He has been appointed to the Educational Council of M.I.T. Tin, who is president of the Dixon-Powdermaker Furniture Company, is one of five Council members in the Jacksonville, Fla., area. As an educational counselor, he will work closely with individual secondary schools and community youth organizations.

Another news item tells that Dr. Don Sinclair has been elected vice-president of the Institute of Radio Engineers.

The November 10, 1958, *Christian Science Monitor* told of the contributions made by Theodore Wentworth to the growth and development of his father's company, Vulcan-Cincinnati, Inc. The article says in part, "Thus, from the year 1933 on, the direction was that of improved methods for the distillation, evaporation, and extraction of chemical products. As vice-president and chief engineer, Mr. Wentworth was instrumental in channeling the operations of the company into that of designing and engineering complete turnkey plants, as well as into the manufacture of special process equipment designed to the customer's own needs. Broad research and engineering responsibilities were assumed by the company."

Changes in addresses since our last notes follow: Marcel P. Aillery, Bayberry Road,

New Canaan, Conn.; John H. Arnold, 10 Pembroke Street, Summit, N.J.; Frederick E. Brooks, Jr., 195 Broad Street, Windsor, Conn.; Colonel Harold H. Carr, 127 East Acacia Street, Stockton 3, Calif.; Gerard E. Claussen, 7514 Far Hills Road, Towson 4, Md.; Charles E. Crawford, 3424 North Central Avenue, Phoenix, Ariz.; Victor J. Duplin, Jr., R.D. #2, Glen Acre Farm, Lynchburg, Va.; Vice Admiral Clarence E. Ekstrom, Commander Sixth Fleet, c/o F.P.O., New York, N.Y.; Gust E. Erickson, 3504 West 22d Street, Minneapolis 16, Minn.; Captain Francis X. Forest, George G. Sharp, Inc., 30 Church Street, New York 7, N.Y.; William H. Jacobs, 99 Yarmouth Road, Chestnut Hill 67, Mass.; John K. Jamieson, International Petroleum Company Ltd., 396 Alhambra Circle, Coral Gables, Fla.; Arthur E. Jorjorian, 4 Old Brook Drive, Worcester 9, Mass.; Tigris H. Kazanjian, 713 Church Hill Road, Fairfield, Conn.; John J. Kennedy, Jr., 96 Scotland Street, Hingham, Mass.; Clarence E. Moyers, 2712 Lafayette Boulevard, Steubenville, Ohio; David Nicoll, 952 Newkirk Drive, La Jolla, Calif.; Frederick J. O'Sullivan, 741 Stanford Avenue, Johnstown, Pa.; Colonel Charles Robbins, Headquarters, Army Chemical Center and Chemical Material Cml., Edgewood, Md.; W. Jim Roberts, 12321 Rock Garden Lane, Miami, Fla.; Dr. Donald B. Sinclair, Nashawtuc Road, Concord, Mass.; H. Sheldon Smith, 175 Danbury Circle South, Rochester 18, N.Y.; Louis F. Stander, 15771 Rosemont Street, Detroit 23, Mich.; Frederic B. Stanley, 101 Sequams Road West, West Islip, N.Y.; Leopold C. Tappey, Chestnut Hill, Conn.; Francis W. Truesdell, 12 Roberts Road, Dover, N.H.—EDWIN S. WORDEN, *Secretary*, 9 Murvon Court, Westport, Conn. GORDON A. SPEEDIE, *Assistant Secretary*, 90 Falmouth Road, Arlington 74, Mass.

1932

Charles B. Bradley, VIII, writes he is magistrate of Middlesex, N.J. He warns that we must watch our speed going through. This must be an interesting sideline from his normal daytime occupation as chief of Physics Section with the Johns Manville Corporation Laboratory in Manville, N.J. Charlie got quite a head start on us in school because he had a daughter named Faith who was born between his freshman and sophomore years at Tech. Now Charlie has been blessed a second time with a grandchild. Talk about speeding!

Lester Glickman, X, has been promoted to technical director of the Quality Evaluation Laboratory, U.S. Navy Central Torpedo Office in Newport, R.I. Les has also been elected president of the Association of Civilian Supervisors in the Naval Underwater Ordnance Station, Central Torpedo Office.

Several of our classmates have made speeches in prominent places lately. John W. Leslie, XV, addressed the ninth annual Maine Highway Conference at the University of Maine in December on the subject of "The Passamaquoddy Tidal Power Project." John is chief of the Engineering Division of the New England

Division of the Corps of Army Engineers. His office has been studying the potentialities of that Tidal Power Project for a number of years, and many of us may remember it was being discussed while we were at school. Albert W. Dunning, II, addressed the Holyoke Lions Club in December on "Business Experiences in Japan." Al is well qualified to speak on this subject because he spent 10 years in Japan as a child when his father was professor of English over there, and not so long ago Al was vice-president of the Monsanto Chemical Company subsidiary in Japan for three and a half years. Al is now director of market research for the Plastic Coating Corporation of Holyoke, Mass. Arthur M. Marshall, XV, from nearby Springfield, Mass., got headlines in his local paper with the following announcement: "Rotary Club Hears Labor Law Expert." Art has had over 20 years of experience in the legal aspects of labor relations and is well respected by the American Bar Association, which has made him a member of their committee on labor law.

Appointments of some of our classmates to various posts have also made news. Harner Selvidge, VI-A, has been elected president of the Soaring Society of America. In addition to being director of Special Products Development for the Bendix Aviation Corporation in Detroit, he is active as a sailplane pilot and holds the Federation Aeronautique Internationale "Gold C" Award with one diamond for achievement in soaring. Harry L. Moore, Jr., XV, has been appointed to the Educational Council. Many of us in the Class of 1932 should serve on this nationwide organization of M.I.T. Alumni, established to assist schools and to counsel young men and women interested in the broad areas of the scientifically oriented education represented at the Institute. It gives us an opportunity to meet some of the young people who aspire to attend M.I.T. and also to encourage the right ones to apply. Harry is serving in the Greenwich, Conn., area. Lewis Fussell, VI, who is research director for Edgerton, Germeshausen, and Grier, Inc., of Boston and Las Vegas, Nev., has been named to the university committee of the Nevada Society of Professional Engineers for a two-year term. The group is organized to provide fundamental training for all engineers who have shown special technical competence in Nevada.

One of our classmates, Carl Ziegler, X, has a problem he wants to share with us. He is a member of the 1959 Fiesta council of the M.I.T. Club of Mexico City. Carl is a division head of the Celanese Corporation in Mexico City. All of our classmates have been invited to be present from Thursday, March 12 through Saturday, March 14. Many side trips are also planned before and after the Fiesta. That sounds like a real place to have our 27th reunion! — ROLF ELIASSEN, *Secretary*, Room 1-138, M.I.T., Cambridge 39, Mass.

1933

We record with deep regret and sorrow the deaths of three classmates, and extend the sympathy of the entire Class

to their families. Mrs. Maria Bates Carpenter, VII, died on November 17 in Lynn; J. Dillard Collins, VI, in Cranford, N.J., on January 10; and Earle McLeod, V, died in November in Boston. Maria had graduated from Simmons in 1920 and took her Public Health degree with our Class; her husband had been executive governor of the Philippines during the Coolidge administration. Dill Collins was vice-president of the Hudson Lamp Company; his brother-in-law, Bill Miller, also of our Class, passed away in 1956; Dill leaves his wife and four children. Earle was with Arnold-Hoffman in Providence as a research chemist and is survived by his two sons. Those of the Class who have suffered losses in their immediate families fully appreciate the residual thoughts and problems which a family tragedy generates; the knowledge that one's friends share in some measure gives courage and faith which helps immeasurably in facing the future.

Three of our associates come in for special honors this month. Beau Whitton, XVII, our genial and thoughtful representative in the Southeast, has become president of the Southeastern Construction Company in Charlotte, N.C., succeeding his father who started the business 38 years ago. Beau has served his native community very well indeed — as an elder in the Presbyterian Church, a member of Rotary, and in several professional posts, including the chairmanship of the local planning board. Beau really hits the nail on the head in saying that the most important elements in the success of any enterprise are experience, ingenuity, and integrity. We have only a brief report on Dave Smith and Don Fink — Dave has become vice-president for Technical Planning and Don is now director of Research for Philco; here, gentlemen, is a pair of minds and personalities that we would stack up against any couplet in the Class. Both are products of Course VI (they have the imprint of such notables as D. C. Jackson, Vannevar Bush '16, and Dean Moreland '07), and they have both demonstrated that M.I.T. products serve the country well. Congratulations to both of them.

Richard Armstrong, IX-B, heading his own company in Philadelphia, reports modestly that his two sons, aged 19 and 21, are at Williams and Wesleyan respectively (and two first-rate schools they are). Dick is in the chemical equipment business.

Harry Summer, XV, dropped in a week ago; he hasn't changed much in 25 years, for he remains his cheerful, outgoing self. Harry had his nine-year-old son in tow — and the latter took himself on a self-guided tour of the main Institute buildings, which is more than your Secretary could do successfully even with the aid of a compass. Harry co-ordinates the multitude of Lerner Shops in the Chicago area, thus knowing more about women's clothes than anyone in the Class. [Harry did not make this statement!]

Cal Mohr, who deserves a gold medal for being class reporter extraordinary, went into orbit over the holidays and spent some time in Rochester and Pittsburgh. Cal reports that Bob (X) Smith's

older daughter graduated from college and is married; Bob's son is doing his military hitch and is stationed at Fort Niagara; and Bob's younger daughter is in a local high school. Cal stopped briefly in Pittsburgh but took the time to check on Ing Madsen, Art Mason, and John King (who is in Cleveland); all are well. Cal also sent excerpts from the December 1 issue of *Chemical and Engineering News* with a neat write-up on Bob Dillon, who has been with Union Carbide in Texas City, Texas, for the last 17 years. Bob is a member of the La Marque City Council, and played a major role in bringing the city manager form of government to his city.

In the press: Morris Cohen, III, with his paper "Rapid-Quenching Hot Stage for Metallography" in the December issue of the *Review of Scientific Instruments*.

On the move — and we would welcome word of cause and effect from each to share with the Class: Emerson Cummings, II, from Ft. Myer, Va., to A.P.O. San Francisco; Leo Dewar, II, from Buffalo to Rochester, N.Y.; Outerbridge Horsey, XV, from A.P.O. San Francisco to A.P.O. New York City; Douglas Ludlam, II, from Springfield, Mass., to Mohawk, N.Y.; Emil Neubauer, II, from La Crosse, Wis., to Sidney, Ohio; Alvah Raymond, VIII, from South Weymouth, Mass., to Chapel Hill, N.C.; and Art Ruge, I, from here in Cambridge to Hudson, N.H., in April.

For those tarrying in New York City at the right time of the month and seeking friendly companionship, the '33 gang lunches together at the M.I.T. Club at the Biltmore on the third Tuesday of each month.

Let's hear from you, please. — R. M. KIMBALL, *Secretary*, Room 3-234, M.I.T., Cambridge 39, Mass.

1934

It is a pleasure to have a significant part in the planning for our 25th reunion. When I said this to Chick Kane '24 in the Alumni Office, he replied: "But of course, all classes are interested in their 25th; so the job of running the reunion is made easy." I am continually surprised and pleased at how right he is.

Some of the more important reunion events were described in the January publicity, and so I do not need to repeat them again in these notes. The entire reunion committee believes that we should make the reunion a quality affair. This can be done with a campus reunion and still live within a relatively modest budget when you consider how much it costs just to sleep and eat away from home for any three-day, four-night combination. The Baker House here on the campus, one of our newer and more comfortable dormitories, is available to the class from Friday night, June 12, through Monday night, June 15. If early returns are significant it is easy to see that our Class is showing considerably better than average interest in our 25th reunion, and it promises to be a whopper.

Both my wife and I were impressed in attending the 1933 25th reunion last summer as guests to see that the regular

attendees and wives were in evidence but also there appeared to be an equally large number of classmates and wives of what I might call the non-party goers. Even though the classmates may now come to Cambridge at the 25th reunion from many parts of the country, from many different professional interests, from many different goals and objectives in life, there is at the 25th reunion some sort of common bond that makes even casual acquaintances of many years ago thoroughly enjoy getting together and becoming reacquainted. It was evident that most people, by the time they are 25 years out, have had a sufficient number of maturing experiences of one kind or another to make the people more interesting to each other and more able to appreciate an opportunity for getting together than was so even a few years ago. I found that classmates and their wives are not just superficially but genuinely interested in their friends' total way of life. I guess what I am trying to say is that there is a great deal more to the 25th reunion than just spending a few days away from home, or making the ordinary business trip, or just looking for a good excuse to tie one on. If you are convinced that our 25th reunion is something that you cannot afford to miss, won't you please send in your advance registration card if you have not already done so.

One of the big factors in making the reunion a success, as well as providing an up-to-date story of our Class, is to have a good reunion book available at the time of the reunion. Charlie Wright is doing a magnificent job of compiling and editing this book, but he still needs your help in obtaining personal history write-ups from as many members of our Class as possible. The number of histories received is increasing daily and the deadline for putting the book to press is rapidly approaching. We hope to have the book include at least a name and current address for everyone in the Class. Some schools, such as our up-river friends, have well over 90 per cent of the 25 year class giving historical material for their class book. Although we would like pictures of families or hobbies to put in the book, the write-ups are the most important and we need one from every classmate.

I look forward to seeing you at our 25th reunion, June 12 to 15, 1959. — MALCOLM S. STEVENS, *Secretaries*: WALTER MCKAY, Room 33-217, M.I.T.; MALCOLM S. STEVENS, Room 1-139, M.I.T., Cambridge 39, Mass.; JOHN A. HRONES, Vice-president for Academic Affairs, Case Institute of Technology, University Circle, Cleveland 6, Ohio.

1935

The M.I.T. Club of New York now has over 2,000 members, is located permanently at the Hotel Biltmore, and serves luncheon and dinner each weekday to members and guests. The new club quarters is well and pleasantly staffed and has its own private bar. A special luncheon meeting day is set aside each month for each Alumni class — Class of '35 meets on Wednesday following the third Monday every month. Ken Finlayson, Bechtel Corp., 485 Lexington Avenue, and Eddie

Edgar, Gilbert Associates, Inc., 61 Broadway, of our Class, are vice-presidents. If you are in the New York area, try to make a meeting.

Don Severance has suggested that you might be interested in knowing those members of our Class serving the Alumni Association in some capacity. They are as follows. On the Alumni Council are: Bissel Alderman, member at large; John D. Hossfeld, Class representative; Beverly Dudley, Honolulu club; and Lawrence C. Hall, Manchester, N.H., club. Class reunions committee includes Ernest E. Van Ham. Departmental Visiting Committeeman is George S. Schairer, Course XVI Aeronautical Engineering. Educational Council includes: Nelson Smith, Birmingham, Ala.; Charles S. Symonds, Coral Gables, Fla.; John J. Ostlund, Miami; Charles N. Debes, Rockford, Ill.; William E. Keefe, Davenport, Iowa; Paul L. Gilmont, West Monroe, La.; William W. Buechner, Arlington, Mass.; Walter H. Stockmayer, Weston, Mass.; Wilton G. Hawes, Grand Rapids, Mich.; Edward Loewenstein, Greensboro, N.C.; Jackson H. Taft, Marion, Ohio; L. P. Whorton, Dallas, Texas; Hal L. Bemis, Haverford, Pa.; Carson L. Brooks, Richmond, Va.; Arthur R. Anderson, Tacoma, Wash.; John B. Ballard, Milwaukee, Wis.; and Alexandre H. Leal, Rio de Janeiro. Recently Frederick F. Tone was appointed in the Rochester, N.Y., area.

Last November, Ernie Van Ham took the plunge and married the very charming Helen Thompson of his present place of residence, Lyndeboro, N.H.; and after a wedding trip to Jamaica, British West Indies, they will live there. We have been wondering what had happened to him — 'All is forgiven, come home.' John L. Fuller has been named assistant director for training at the Jackson Memorial Laboratory, Bar Harbor, Maine. Dr. Fuller was formerly assistant professor of zoology at the University of Maine. C. J. Wilson has recently joined B.I.F. Industries, Inc., as eastern regional engineer. Thomas K. Graham, formerly manager of the Raritan Copper Works of International Smelting and Refining Co., has been advanced to the position of assistant metallurgical manager of the Anaconda Co. Tom is married and has two girls and a boy. Ermano Garaventa was made factory manager of Hamilton Standard, division of United Aircraft Corp., this past fall. He lives with his wife and three children at 109 Lakewood Circle North, Manchester, Conn. — FRANCIS W. MULDOWNEY, JR., 1109 Boylston Street, Chestnut Hill 67, Mass.

1936

Many of the members of our Class have been on the move lately. We will give you the changes in small doses to break the monotony. Tom Brown is now at 16949 South Western Avenue, Gardena, Calif. Phil Vincent's new address is Curtiss Wright Corp., Industrial and Scientific Products Division, Princeton, N.J. Lee Tolman is located at 6612 Mossman Place Northeast, Albuquerque, N.M. Lee has also dropped the "Major." Ben Slom is at 253 Broad Street, Portsmouth, N.H. Lyman Hill's new address is 1110 Wynch-

wood Road, Westfield, N.J. John Sheehan is in Hollywood, Fla., receiving mail at P.O. Box 790. Hans Lang is now at Stettensstrasse 48, Frankfurt/Main, Germany. Bill Reilly's new location is 82 Sutton Road, Needham 92, Mass. Jim Hanson's address is 193 Long Beach Avenue, York Village, Maine. Nelson Tower is at 53 Wheatshaf Lane, Princeton, N.J.

Ed Dashefsky has been named manager of the Raytheon Manufacturing Company's Lowell missile plant. Ed has served as assistant manager for the past two years and has been with Raytheon since 1951. Upon leaving Tech he worked for Sever-Sky Aircraft and Sikorsky Aircraft as a structures engineer before joining the Curtiss Wright Company's Airplane Division in Buffalo in 1937. In 1945 he served as a structures engineer for Fairchild Engine and Aircraft, remaining there until he came with Raytheon in 1951. In 1953, Ed was named staff assistant to the manager for the Lowell plant; and in 1956, assistant manager. He is a past president of the Boston Chapter of the American Institute of Aeronautical Sciences and lives at 15 Great Meadow Road, Newton Center, Mass.

A note from Don Severance tells us that the Alumni Association has nominated the following members of our Class for the position of Alumni member on the M.I.T. Corporation Visiting Committees: Semon Knudsen for the Department of Mechanical Engineering and Howard Turner for the Department of Chemistry. William Hewlett has been renominated to the Committee for the Department of Electrical Engineering. Malcolm Blanchard is secretary of the M.I.T. Club of Oregon. Mal's address is 2546 Southwest Vista, Portland, Ore.

Francis Bonzagni has a new address, 233 Roosevelt Avenue, Springfield 8, Mass. Bob Saslaw is now at 15 Croft Road, Poughkeepsie, N.Y. Paul Smith has moved to 7324 East 19th Street, Indianapolis 19, Ind. Captain Don Brown is at Norfolk, Va., 5440 Argall Crescent. Bob Wignot is at 214 West Franklin Street, Taylorville, Ill. Art Cohen's new address is 31 Sturges Highway, Westport, Conn. Tom Terry is now with Southern Nitrogen Company, P.O. Box 246, Savannah, Ga. Mrs. Marion Lawson is located in Pawtucket, R.I., at 69 Dryden Avenue.

Elmer Davis has been selected to head the Research Equipment Section within the Engineering Division of Arthur D. Little, Inc. Elmer will administer the engineering, prototype development, and fabrication of various items of specialized equipment supplied by the firm to laboratories and industry throughout the world. Elmer has been active in engineering research and development since 1942. For the past two years, he has headed a liquid oxygen engineering project at A.D.L. for the Air Force. He has managed new weapon developments for the Army, Navy, and Air Force, and has been instrumental in developing completely new types of equipment to replace manual techniques. He lives with his family at 314 Ocean Avenue, Marblehead, Mass.

We end this reporting with a sad note. Bill Nelson of Stony Point, N.Y., an executive of Pathescope Productions, Inc., a motion picture company, died July 8,

1958. He served during World War II as chief of the photographic divisions of the Office of War Information and director of training films for the Navy. Also two other members of our Class passed away: Dan Norman of 10758 Somerset Road, Detroit 24, Mich., in 1957; and Lieutenant Colonel Charles Endweiss of 222 East 71st Street, New York, N.Y., in September of 1958. — JIM LEARY, *Secretary*, One Putnam Park, Greenwich, Conn.

1937

H. (Nick) Nickerson writes: "I lingered around the halls of M.I.T. somewhat longer than most of you and picked up my Ph.D. in 1940 — Organic Chemistry. Thence immediately to Charleston, W.Va., to toil in the Process Development Laboratories of Carbide and Carbon Chemicals, except for a brief week late in July of 1940 when I married Lucille (Simmons College '37). In June of 1941 I came back North with Dewey and Almy Chemical in Cambridge. But in May of '42 my reserve commission became a binding contract and I went into the Chemical Warfare Service, first at their laboratories at M.I.T. and finally in the Medical Division laboratories at Edgewood Arsenal, where I ended up as a captain in charge of (of all things for a polymer chemist) the food chemistry section.

"December of '45 found me with DeBell and Richardson, Inc., as the chief chemist — in fact as the only chemist. This was a young firm just starting out, offering consulting services in the field of plastics. I say 'young firm' but actually John D. Bell is M.I.T.'17 and Richardson is not much younger. The firm grew and prospered and now has quite a large staff occupying several thousand square feet of a number of old mill buildings in Hazardville, Conn. I was no longer the only chemist, but instead had quite a group under me, was a director of an affiliated company and a stockholder in two offshoots. It was therefore quite a surprise to a number of people when I resigned on March 1 of last year. My reasons would take too many words to explain here. Let's say that after 18 years of plugging I felt I deserved and could afford a sort of sabbatical leave. I'm enjoying it, doing some consulting work on my own, and finding surprisingly little dead time. With a little encouragement I could go on like this indefinitely.

"We have our own house, designed and built for us in '54, situated on several acres of land on a hilltop overlooking the Connecticut River Valley. Our daughter Gail, aged 14, is turning into a rather stunning redheaded beauty; and our son Craig, aged 11, seems to be as difficult a child as my older sisters say I was — which was difficult indeed. I'm moderately involved in local politics, a member of the Republican Town Committee, and a thorn in the side of the present Democratic majority, particularly the board of education, which I have criticized publicly and vehemently for several years. Last year I engineered a coup which took the elementary school building program out of their hands where it had lain dormant for far too long, and they have never forgiven me. At present I am chairman of a

committee building a half million dollar school, and we are working on the plans for another. That, with Rotary and many other things, keeps me out of mischief and the decay of old age." Nick, a fine report that brings us up to date. I hope that other members of our Class will take note and send along a similar account of their activities.

Dick Hutchinson is now at International Minerals Chemicals Corporation as chief industrial engineer at the Bonnie Chemical Plant. Dick, with his wife Mary Ellen and their one child, live at 845 Susan Drive, Lakeland, Fla. Link Herzeca has moved to 50 South Carll Avenue, Babylon, N.Y. L. Charles Hutchinson is self employed in mathematics research. Hutch and his wife, Martha, with their two children, live at 108 Webster Street, Marshfield, Mass.

The M.I.T. Club of New York now has nearly 2,000 members and is permanently located at the Hotel Biltmore. It has its own private bar and serves lunch and dinner each weekday to members and guests. The Club has an excellent series of technical and social events, centered about its fine new club quarters. Jointly with their Long Island and Westchester affiliated groups, they are running a series of events — one or more each month. Their technical program is very closely tied to the Institute, with key faculty members as speakers. Of interest to an out-of-town Alumnus is their monthly program of class luncheons. A regular luncheon meeting day for each Alumni class is scheduled one day a month. Our class is scheduled for the Thursday following the third Monday. If you have occasion to visit New York, try to make our class luncheon. George B. Wemple, Mutual Chemical Co. of America, 99 Park Avenue, New York City (phone HA 2-7300), our class sponsor, will give you a warm welcome.

Just learned that Norm Birch and his boys, Eric and Alan, were photographed at the last Alumni Day; and the picture of them at M.I.T. was on the front page of the *Boston Herald* the next morning. Quite a thrill for the boys. Norm, Elvie, and the boys are at Route 6, Sappington, Mo. — ROBERT H. THORSON, *Secretary*, 506 Riverside Avenue, Medford 55, Mass. S. CURTISS POWELL, *Assistant Secretary*, Room 5-323, M.I.T., Cambridge 39, Mass. JEROME E. SALNY, *Assistant Secretary*, Egbert Hill, Morristown, N.J.

1938

We have a news item that announces a new position for Homer Oldfield. He has recently joined Raytheon Manufacturing Company as assistant manager of the Government Equipment Division, which operates a plant in Dighton, Mass. He was with General Electric Company for the past 13 years. Theodore Lisberger of General Electric recently spoke at a meeting of the American Society of Training Directors. He became a training specialist in 1953, and his topic was appropriate to the field: "Changing Human Behavior."

Another of the Class in a new position is Harlan Turner. He has been appointed to the newly created post of technical assistant in the design department of the Electric Boat Division, General Dynamics

1939

During a recent eastern swing, I enjoyed visits with Bob and Aletta Touzalin in Aurora, Ohio, which is about 40 miles southwest of Cleveland. In addition to his engineering duties with A. G. McKee and Company of Cleveland, Bob (with Aletta) has done a major part of the construction of their new house, which turns out to be strategically located near the 14th tee of their golf club.

In Kansas City I saw Dick Muther '38, who was doing consulting engineering in the time and motion study and work simplification field and also in other fields of corporate management. Between writing books and magazine articles, Dick has wedged in a consulting commission to Sweden and had returned to Kansas City just three weeks before I was there.

Bill Brewster has recently been promoted to vice-president and director of the United Shoe Machinery Corp. Bill and Lucille are living at Plymouth, Mass.; have just completed an addition to their old Cape Cod house; have expressed their intention to attend the reunion; and, with their two youngsters, are preparing to extend a little of the old New England hospitality to visiting firemen who will be dropping in on them about reunion time.

Bill Guy has been named assistant general manager of Rocketdyne, which is a division of North American Aviation, Inc., in the northwest Los Angeles area. In addition to keeping busy with the Cloud Nine boys in the missile program, Bill is active in Alumni Fund work.

Morrie Nicholson has earned his Ph.D. a number of years ago and for several years now has been professor and head of the Department of Metallurgy at the University of Minnesota at Minneapolis. In addition to his formal duties at the University, Morrie heads the local chapter of the American Society for Metals, has gotten into the usual extra-curricular activities including Scouting—the last probably inspired by his three sons, aged 14, 11, and 5.

Here are some special notes from the Christmas cards: Bob Casselman is vice-president—sales for Polaroid. Dotie wrote on a Christmas card which included a picture of Margie, almost 17; Carl, 14 and one-half; Ted, 11; and Fritz, 9: "As you can see, we are healthy, happy, and far too busy in the myriad of activities. I flew to Germany with Bob for a meeting of Photokina (world's largest photograph show) in Koln and ended up working, demonstrating and explaining the Polaroid camera in German! Looking forward to seeing you in June. Had a great reunion with George and Betty Estes in London, where George is foreign manager for his company."

Al Laker is secretary of the Southern California Brick and Tile Manufacturers Association and dropped in during the holidays. Woody, Phyllis, and Billy Baldwin of San Pedro, Calif., sent a most unusual and attractive Christmas card particularly appropriate for the times and designed by the Pacific Unitarian Church.

Woody is busy planning on the national missiles program for Ramo-Wooldridge and lives at 2036 MacArthur Street, San Pedro, Calif.; he probably would be glad to hear from classmates and also to send you a copy of this card.

Maynard and Kitty Drury with their Mary, Walter, Esther, Jack, and Carol are still living on Long Island, are associated with American Smelting and Refining Company, and I believe are much interested in raising purebred Newfoundland dogs. At least I inferred that from the picture on the front of their very attractive Christmas card.

Others who have written to send regards and expressed intention of being at the reunion are: Jim and Mary Barton (Boeing, Seattle), Os and Lucille Stewart (*Factory Management and Maintenance* magazine), Dave and Sally Frankel (Machlett Laboratories, Chicago), Bill and Adie Pulver (Millerton, N.Y.), Bob '40 and Masie Fife (Redondo Beach, Calif.), Gus and Prilla Hunicke (Scituate, Mass.), and Wylie and Phyllis Corl (Philadelphia).

From the Class of '40 we received greetings from Chuck and Miriam Godfrey. Chuck is working on hydrogen fusion projects at Livermore, Calif. Nils and Janet Rosenberg, Seattle, Wash., took time out from starboating to say they were making plans for their own reunion the year following ours.

Newspapers are recognizing some of our classmates as follows: Leo A. Kiley has been awarded the Legion of Merit for outstanding work and leadership while heading a group of scientists doing research in connection with radiological warfare defense for the United States Air Force. Leo and his wife, Luna, and three children live at Kirtland Air Force Base, New Mexico.

Professor William R. Hawthorne has invented a new type oil tanker which was pictured in the November 22 *Science News Letter*. This tanker is the flexible sausage-shaped barge called Dracone. Capable of carrying about 40 tons of kerosene, it is a huge tubular skin of woven nylon fabric impregnated with rubber. Dracone is said to be impervious to oil on the inside and to sunshine and salt water outside. The 100-footer is five feet in diameter, can carry solids.

Dr. Robert H. Cotton heads up the laboratory at Rye, N.Y., for the Continental Baking Company. There he researches better ways of baking bread and cake. Here is one for Syd Silber, who owns a chain of bakeries in Baltimore. It is a safe bet that neither of these two classmates visualized in 1939 the things they would be doing in 1959.

Bob Pratt has been recently promoted at Pratt and Whitney Aircraft in East Hartford. He has taken over the JT3D engine program, lives at 122 Waranoke Road, Manchester, Conn., with his wife and two children.

I.T.T. Laboratories, division of International Telephone and Telegraph Corporation, have announced promotion of Norm Capen to manager of Electronic Reconnaissance, and of Richard H. Myers to manager of Avionics. Both of these classmates were formerly executive engineers at Federal Telecommunications.

Dr. Paul Gordon has been advanced to full professor at the Illinois Institute of Technology. At M.I.T. he was in charge of physical metallurgy for the Atomic Energy Commission. In Chicago he built a unique laboratory for testing the effect of heat on metals. He won the 1957 Mathewson Gold Medal from the American Institute of Mining and Metallurgical Engineers for a research paper published in the *Journal of Metals*. John N. Hobstetter, formerly a member of the technical staff of the Bell Telephone Laboratories, has been appointed associate professor of metallurgical engineering at the University of Pennsylvania.

Here is one for the "really, aren't we getting old" department: announcement was recently made that in the Class of 1962 is registered David Francis Pope, whose father turns out to be classmate Harold W. Pope. All the best to both the son and the pappy.

Kenneth D. Roberts of 127 Main Street, Rocky Hill, Conn., has been named an assistant professor at the School of Engineering of the University of Massachusetts in Amherst, Mass. Ken will teach metallurgy and materials of engineering. Don Waterman has been appointed plant security officer for the Bridgeport, Conn., division of the Singer Manufacturing Company. Don was formerly assistant superintendent at the Bridgeport Works. After serving as a captain with the U.S. Corps of Engineers, Don joined Singer in 1946.

Fred R. Sheldon has been named general manager of the applications section in the Department of Research and Development at Food Machinery and Chemical Corporation, New York. Fred was formerly with the Becco Chemical Division, where he held various research and sales service positions. In 1956, he was named manager of Pulp and Paper Research Development and later, Research Laboratory Manager.

John J. Casey, Chairman of the membership committee, M.I.T. Club of New York, located in the Biltmore Hotel at 43d Street and Madison Avenue, has written to say that this club has a regular luncheon meeting day for each Alumni class once per month. He invites '39 classmates in the area to phone for details.

And now as these notes close in January, 1959, for publication in the March issue, let's be planning forward to having fun and pleasant reminiscences at reunion on Cape Cod (or wherever the committee locates it) in a couple of months.—HAL SEYKOTA, *Assistant Secretary*, 416 Calle Mayor, Redondo Beach, Calif.

1940

It is with regret that I must report the death from heart disease on November 29, 1958, of Frank J. O'Neil, who was a member in Course II. Frank was past chairman of the New England section of the American Association of Textile Chemists and Colorists and also was a member of the American Society for Testing Materials and the Optical Society of America.

Charles Fitter has been appointed to Tech's Educational Council for the Roch-

ester, N.Y., area. Charles, at present, is a technical assistant in the International Division of the Eastman Kodak Co.

Your Secretary received with pleasure the annual Christmas letter from the Keyeses, and is taking the liberty of passing it along to you: "Dear Friends, The 'year of the women' began for us with Kristin's arrival on January 10. Breaking the boy monopoly has made her our big hit. We are all still growing. Daddy's hair gets grayer. He says, 'I don't care if it does get gray as long as it doesn't vacate.' With all the work and care Mommy has, we do not understand how she looks prettier with each year. We generally do not see the boys growing, but frequent trips to the shoe store lets us know its taking place. . . . Courtney's new adventure is kindergarten. He is changing—his gang sometimes becomes more important than his home. Timmy has built two helicopters and a boat, all with just a few boards and some nails. Last year's heavy spring rainfall furnished a flowing creek nearby—at least until the Fourth of July. Here Court and Tim learned to swim. Husky Greg is too old and tough to play with Kristin, but he works hard at keeping pace with the older boys. He does not swim yet but loves the water. He is at present our best helper—gathering walnuts and carrying tools. . . . We still like living in Pleasanton. Our yard is spacious and we have done a lot on it. The problem is to make it manageable when a lot of other things need managing, too. We installed a patio over one of our best weed patches. The chicken coop we considered too hazardous for the children and took it down. A vegetable garden will take its place. . . ."

"Year 1959 must see the expansion of the house in order to match the expansion of the family (none of the latter planned in '59). Another bedroom and bath and a family room are needed. . . . Our hideaway is only three miles off U.S. Route 50, a little road between New York and San Francisco. Please drop in when traveling through. . . . Wishing we could see all our friends again, but in knowing that we cannot, we hope this letter conveys to you as it does us a happy memory. . . . Wishing you have a very happy Christmas! With fondest regards from Ray and Virginia, Court, Tim, Greg, and Kristin Keyes."

Lester Lees and Dick Speas each served as chairman for two of the sessions of the Institute of the Aeronautical Sciences at the Hotel Astor, January 26 through 29.

W. Kenneth Davis received the American Institute of Chemical Engineers' Professional Progress Award in Chemical Engineering at the meeting of the American Institute of Chemical Engineers at Cincinnati, Ohio, on December 8, 1958. Kenneth received the award for his leadership in the engineering developments of nuclear power. At present he is vice-president of the Bechtel Corporation in San Francisco. Prior to that he was on the staff of the U.S. Atomic Energy Commission, his last position with that agency being as director of reactor development where he was responsible for all reactor development including civilian power, naval, aircraft, merchant marine, and military power reactors and for related

engineering development work.—ALVIN GUTTAG, *Secretary*, Cushman, Darby, and Cushman, American Security Building, Washington 5, D.C. SAMUEL A. GOLDBLITH, *Assistant Secretary*, Room 16-325, M.I.T., Cambridge 39, Mass. MARSHALL D. MCCUEN, *Assistant Secretary*, 4414 Broadway, Indianapolis 5, Ind.

1941

Dot Fox writes that Bill has been very sick for some time: starting with flu early last year, he developed pulmonary tuberculosis, and had to enter a sanatorium on March 28. He had surgery on his lung (lobectomy) in October, but is now progressing as well as can be expected. He was able to be home for the first time for 12 days over Christmas, and he has hopes of being discharged from the sanatorium in the fairly near future. Dot and the children (Dianne, 13; Jim, 9; and Don, 4 and one-half) are well. A word of cheer is always very welcome at a time like this, so drop a line soon to W. J. Fox, 1934 Edgewood Road, Towson 4, Md.

Had Christmas cards from Sam McCauley, Bob Montana, and Carl Aronsen, who wrote: "Saw Tony Fiorentini in New York when they had the Naval Architects and Marine Engineers meeting uptown here. He looks just the same as ever. Things are a little slow now, but have traveled from Gander, Newfoundland, to Galveston, Texas, at various times this year. Spent about six weeks in Galveston on a big collision job."

Effective January 5, Wyle Laboratories and Wyle Research Corporation were merged under the name of Wyle Laboratories, with Frank Wyle as president. The merger establishes the firm as the country's largest missile and aircraft components testing organization; the aim is to combine the Laboratories' testing skills and facilities in cryogenics, pneumatics, hydraulics, mechanics, and fuels with the specialized capabilities of Wyle Research in the testing of electrical, electronic, and instrument components and systems. Effective the same day, Mantec, Inc., was merged into Wyle Manufacturing Corp. with Frank Wyle as president. Apparently Frank manages the testing operations with one hand and the building of the test equipment with the other. All of these operations are in El Segundo, Calif.

From reading between the lines of a recent address change, I suspect that Stan Smolensky has transferred to Raytheon's missile plant in North Andover, Mass. Baird-Atomic, Inc., under the presidency of Davis Dewey, reports a profit of 53 cents per share and a backlog of over \$2 million at the end of 1958, most of the backlog being in research and development work on military infrared systems, special electronic and precision optical systems. Dr. Dewey has recently been elected a director of Atomic Industrial Forum, Inc., a management association of companies and individuals active in the nuclear industry.

At the annual meeting of the Institute of the Aeronautical Sciences in New York, Courtland Perkins was chairman of a session on space exploration. And, speaking of New York, the M.I.T. Club there has an excellent arrangement of

monthly class luncheons at their headquarters at the Biltmore Hotel. The fourth Monday of each month is the '41 day; so if you are to be in town, plan to pay them a visit. If you know in advance, a note or call to Carl Mueller at the Bankers Trust Co. will assure you of a warm welcome.

An article from the *Worcester (Mass.) Telegram* on the Polish community in the area, and their celebration of 350 years in America, contains this apt and vivid description of one of our Class: "Out of Dudley, full tilt and raring to go, sprang Teddy Walkowicz, now of New York City. His title is member of the security panel of the Special Studies Project of the Rockefeller Brothers Fund, Inc. He is an aeronautical engineer and a specialist in intercontinental ballistic missiles, concerned with the nation's defense against push-button atomic warfare. During World War II he was a glider test pilot for the Air Force." We also hear that Ted recently established a mathematics scholarship at Bartlett High School in memory of the mathematics teacher who inspired him to take up engineering.

Serving actively in the Alumni Association this year are Reid Weedon, Vice-president and Class representative on the Alumni Council, and Midwinter Meeting Chairman; Hank Avery, member at large of the Council; and Howie Morrison, an associate of the Council. The following men are members of the Council and represent the M.I.T. clubs listed (though the club location is not indicative of where the man lives): Ed Beaupre, Houston; Ed Marden, St. Louis; and John Waller, Providence. The following men are serving as educational counselors, maintaining friendly relations with local secondary schools and interviewing prospective students, in the areas listed: Dave Thurlow, Birmingham; Jim Cullison, Palos Verdes, Calif.; Don Scarff, Oakland, Calif.; Cliff Moffet, San Francisco; Joe Bowman and Nort Polivnick, Denver; John Purinton, Waterbury, Conn.; Lew Fykse (regional chairman), Greenwich, Conn.; Jim Pickard, Washington; Jim Sligar, Indianapolis; Bob Meier, Hazel Park, Mich.; Laurence Russe, St. Louis; Ed Beaupre, Nashua, N.H.; Carl Mueller (regional chairman), Ridgewood, N.J.; Porter Evans, Tenaflly, N.J.; Joe Gavin, Huntington, Long Island; Ralph Wilts, New York; Howie Samuels, Canandaigua, N.Y.; Luke Hayden, Syracuse; Bill Orr, Pisgah Forest, N.C.; Carl Goodwin, Bay Village, Ohio; Herm Affel, Bill Hargens, and Herb Moody, Philadelphia; Hank Avery (regional chairman) and Knut Johnsen, Pittsburgh; Cranston Gray, Greenville, S.C.; and last but by no means least, Frank Storm, Amarillo, Texas.

The following men are serving the local clubs listed: Sam McCauley as president, Herb Moody as secretary, and Bill Hargens as treasurer, all of the Philadelphia club (no 22d amendment for them!); Bill Summerhays as treasurer, Rochester; and Harold Radcliffe as secretary, M.I.T. Club of Central Florida (Tampa).—IVOR W. COLLINS, JR., *Secretary*, 9 Sunnyside Drive, Dalton, Mass. HENRY AVERY, *Assistant Secretary*, Pittsburgh Coke and Chemical Company, Grant Building, Pittsburgh 19, Pa.

AFRICA! From Albert National Park in the Belgian Congo Ronald Shainin rushed some color pictures to *Life* magazine which appeared in the January 12, 1959, issue. The article accompanying his four superb color pictures is as follows: "... the earth suddenly split open and red-hot lava poured out. Nearby, Ronald Shainin, who is making animal movies and collecting specimens for United States zoos, heard of the eruption and rushed to the spot. Pitching his tent on a hill five miles away, he began photographing the spectacle. 'Molten rock was being hurled a thousand feet in the air' he recalls. 'For two days and nights I was showered by lava dust.' Later he crunched through the still warm fields of 18-inch deep volcanic ash to within 50 yards of the hot lava flowing at the base of the volcano's cone.

"Exploding every few seconds, the cone at the volcano's center soon grew from a small mound into a 400-foot high crater. From it, a stream of molten lava stretched down through the jungle for 13 miles, carrying the foliage in a 300-yard, wide swath. Beasts fled the spot. For volcanologists all this was normal in a new volcano, and they added it to the list of some 500 volcanoes now active in the world. For Congo natives it was fearful. Watching the ever growing current of fire, they named it *Kitsimbanyi*—meaning 'he who rises swiftly.'" Ron's older brother Dorian, Class of '36, says that raising five children seems to be a somewhat less hazardous existence than Ron's "routine" expeditions to Africa. Ron missed our 15th reunion because of his latest trip. We all wish him the best of luck and grand adventure and hope that he will be with us at our 20th with some stories and his photographs.

A Christmas card arrived a short while ago from San Mateo, Calif., telling us that Morris Steinberg has recently joined the Lockheed Missile Systems organization. Along with his official duties Moe appears to have joined the local chamber of commerce. He writes: "Natlee and I have been out in California for the last five months, love it, and have seen so many friends out here. I came out as staff assistant to the director of Research at L.M.S.D. and am now manager, Materials and Projects Research. I see Bill Kellogg, Milt McGuire'41, Howie Zwemer'47, and spoke to Heine Shaw, who is down in Los Angeles, the other day. Ray Wyland dropped in last week; and also last week, Natlee and I had dinner with Larry Bernbaum'40. The children love it and the weather has been ideal—a warm mild winter."

The M.I.T. Faculty Club, high above the Charles River, is a delightful place to meet fellow Alumni and spend a few pleasant hours from time to time. On a recent stop I ran across Frank Staszsky. He reports that a fifth child was added to the clan on the day before Thanksgiving. The little boy's name is Paul. Frank and Barbara's other children are Frank, Jr., 12; John, 10; Barbara Jane, 7; and Faith, 4. In addition to his many duties at the Boston Edison Company, Frank is vice-president of the Engineering Societies of New England and regional secretary of

the American Society of Mechanical Engineers.

Dr. William H. Dennen, another denizen of the Faculty Club, is now associate professor of geology and director of the Cabot Spectrographic Laboratory of the Institute. Bill's general fields of interest are physical geology, mineralogy, and geochemistry, with particular interests in developing and refining methods of spectrochemical analysis and applying them to geological problems.

Dr. Irving S. Fagerson, Associate Professor of Food Technology at the University of Massachusetts, is a coeditor of a new book containing the proceedings and discussions of the International Symposium on Gas Chromatography. Dr. George J. Yevick, Professor of Physics at the Stevens Institute of Technology, was awarded the honorary degree of master of engineering at the opening convocation of the engineering college last fall.

New Navy assignments are for Captain Carter L. Bennett on the U.S.S. *St. Paul* out of San Francisco and Captain James S. Shilson, Commander of Fleet Activities, also out of San Francisco.

Among the longest distance moves this month was that made by Bradford Darling from Winchester, Mass., to Woodland Hills, Calif. Colonel Richard C. Gibson has transferred from the Holloman Air Force Base in New Mexico to Washington, D.C. Dick is now with the Headquarters A.R.D.C. at the Andrews Air Force Base. Joseph E. Welsh has left chilly Brookline, Mass., for Santurce, Puerto Rico. Also relocating at this time are Joseph C. Boltinghouse in Whittier, Calif., and Harry J. Paletz, Jr., in Gary, Ind.

Your *Secretaries* send warm wishes for good early spring gardening weather.—J. J. QUINN, ED EDMUNDS, BOB KEATING, and LOU ROSENBLUM, Photon, Inc., Cambridge 41, Mass.

1943

Bob Fay'42 forwarded a letter he received from Charley Holt from London, where the Holts have been since last September. Charley is doing research on the problem of economic stability at the London School of Economics under a Ford Foundation grant. He and Mary Lou and their children, Wendy and Thea, seem to be having a ball there, and are participating in everything English, it seems. Raymond Redheffer, who is an associate professor of mathematics at the University of California in Los Angeles, is co-author of a new book published by McGraw-Hill entitled *Mathematics of Physics and Modern Engineering*. Philip Polley of Melrose, Mass., a senior mechanic with American Airlines, has completed a course of instruction in the maintenance of American's new jets. He has been with American since 1948.

Jean Hartshorne, who last fall was running hard for public office, was appointed the new light commissioner in Wakefield, Mass. But by the time you read these notes, Jean will be running again, as his job will require an election in March of 1959. John Harsch of Naugatuck, Conn., was one of the speakers at the Naugatuck High School Engineers' Night last No-

vember. Bill Scola of Worcester, Mass., was recently sworn in as a deputy sheriff. Bill's real work is as president of Scola Construction Company; but if you get pinched in Worcester, Bill will be glad to watch you pay your fine.

Mel Clark is doing some research at Tech under a grant of the National Association of Music Merchants. Dick Adler is coauthor of a paper in the Institute of Radio Engineers *Proceedings* on optimum noise performance of linear amplifiers. And quite a few others in our gang have been busy. Witness this list of names drawn from the active Alumni affairs group. On our Alumni Council we have Bob Anderson, Ray Richards, and Jim Hoey. As secretaries of their respective local M.I.T. clubs, we have John Shutack in Chicago, Bob Lichten in Dallas, Howie Bollinger in Westchester; Chris Matthew is president of the San Francisco club, and Burt Angell is vice-president in Schenectady. As members of the Educational Council we have Earl Bimson in Phoenix; Ed Stewart, Jr., in Palo Alto; John Harsch in Waterbury, Conn.; Jim Newmeyer in Miami; Bob Meissner and Bob Reebie in Chicago; Oscar Wilhelm in Davenport, Iowa; Herb Johnson in Springfield, Ill.; Joe Polack in Baton Rouge; Carroll Hornor in St. Louis; Howard Gleason in Rochester; Hugh Pastoriza in White Plains; Steve Hazzard in Warrington, Pa.; Bill Laird in Pittsburgh; Andy Plonsky in Scranton; Sid Atlas and Barry Russell in Houston; Frank Briber in Milwaukee; and Virgilio Barco in Colombia, South America.

The M.I.T. Club of New York invites all visiting firemen to use their facilities at the Hotel Biltmore; our Class meets there on the Tuesday following the fourth Monday of each month for lunch. I'll have coffee black, please.—RICHARD M. FEINGOLD, *Secretary*, 49 Pearl Street, Hartford 3, Conn. *Assistant Secretaries*: CHRISTIAN J. MATTHEW, 314 Battery Street, San Francisco 11, Calif.; JOHN W. McDONOUGH, JR., R. R. #1, Donwood Drive, Naperville, Ill.

2-'44

This month brings interesting news about moves by various members of the Class. Scipio deKanter has moved to Tyler, Texas, from Cedar Grove, N.J. Dick Livermore has moved to West Linn, Ore., from Whittier, Calif.; and Art Hoge has moved from Bristol, Conn., to Walpole, Mass. Unfortunately, there is no further news on these moves.

J. Ross Macdonald, who is now Doctor Macdonald doing solid state physics research at Texas Instruments Central Research Laboratory in Dallas, has been named a fellow of the Institute of Radio Engineers. The grade of fellow is the highest membership grade offered by I.R.E. A. A. (Bud) West has been elected to the board of directors of the Air Force Association. He is presently manager of contract administration in General Electric's Defense Systems D Department headquartered in Syracuse, N.Y. He will no doubt be working on the many problems facing the A.F.A. on a national basis. Congratulations to both Mac and Bud in their new honors!

Your pinch-hitting secretary has taken on the job of regional Alumni solicitation chairman for Westfield-Mountainside. It looks as if we are going to have a terrific year; and instead of this region ending up fourth nationally in the list of regions over 100 Alumni, we are shooting for the top honors.

Just talked to Burt Bromfield, Chairman of the reunion committee, and he's singing the blues. Claims that he really didn't have enough space in his recent letter to the Class to go into the nice room layouts, beautiful view, and typically New England surroundings of the Chatham Bars Inn. The more he talked the more enthusiastic he became. The low power soft sell sure took on me, and anyone I see from '44 in my wanderings in the next six months will be a prospect for a gentle nudge.

As a means of organizing groups from the larger cities, Burt Bromfield, John Hull, and I have been asking fellows in various cities to act as local reunion chairmen. Arnold Mackintosh is heading up the group in Rochester, and Austin Dodge is doing the honors in Washington, D.C. Both Burt and John have been active also, and next month's notes will give the names of the fellows they have lined up. — PAUL M. HEILMAN, *Temporary Secretary*, 616 Forest Avenue, Westfield, N.J.

1945

Although these notes will reach you in March we should by rights call this issue our Christmas epistle, as cards and notes are our sources of information. My greatest wish as your feeble-minded Secretary is that the flow of Christmas notes and letters would continue throughout the year. Won't you make me happy?

In mid-December we received a brief post card from Prexy Dave Trageser as he hurried around Europe on an 18-day business trip. Dave followed through with a letter soon after Christmas saying that he had thoroughly enjoyed his stops in Germany, Denmark, Italy, and England, although he did indicate that he did not get a representative impression of the politics and characteristics of each country while on such a "whirlwind"; but the food and hotels were excellent, as was the merchandise available for consumers. Dave flew on six different airlines and his impression of Pan Am's Boeing 707 is such that I feel he could be used as a paid commercial! Dave reports that he and Mary heard from Lois Thorkilsen out in Northbrook, Ill.; no news of Hal other than he is still knocking himself out for Colgate.

Following their regular ritual, the Jim Hoaglands of Phoenix, Ariz., sent out their usual "friends and relations" letter, which we are pleased to quote in part: "Life continues to be good to us. We're all healthy and growing, the children vertically and the parents horizontally. It seems to us that our school is demanding more of its students these days than it did a few years ago, which is to the good, even if it took Sputnik to accomplish it. Johnny has added the French Horn to his list of instruments played less than perfectly, and is enjoying orchestra work for

the first time. Judy and Nora are enjoying their pets and creative dancing, and are looking forward to more riding after Christmas.

"Mary keeps busy with politics (*nota bene* Republican success in Arizona), church, Parent Teachers' Association, Camp Fire Girls, and an interesting citizens' advisory committee for the Phoenix Union High School System. She managed to break 100 on the local (easy) golf course last summer, but hasn't had time to play since then.

"Jim has kept his nose to the grindstone and almost had it ground off this year because of a business recession. However, Messrs. Carns and Hoagland just celebrated the completion of five years of operation as Carns-Hoagland Co. and hopefully think the next five years will be a bit easier."

Parenthetically, we might add that Mary and Jim have a fine looking family; young Johnny is a dead ringer for his old man; however, I suspect Jim has added a few pounds the past decade or so, although it is difficult to determine as two of the kids are sitting in his lap in the photo we have.

While in the West a stop in San Francisco would find the Vincent Butlers all in good health. I know that all Vince's friends will be relieved to learn that Lynn has a tendency to look like her charming mother Bobbie rather than the masculine side of the family. While in California we might add that Waite Stephenson is back home so to speak now with Lockheed Aircraft. Waite is married with two children; unfortunately we have no data on the recent offspring.

Traveling down into the Southwest you might be tempted to stop in Pampa, Texas, to see Wil and Curt Beck and their latest member of the family — Curt Emile, born December 4, weight nine pounds, three-fourths ounce; yes, they grow them big in Texas! While in the Dallas area don't miss seeing Jake and Kate Freiburger as well as Nick and Rosemary Mumford. Nick reports that they see Jake and Kate regularly, and I suspect Jake is still in the laundry business. Nick, of course, is still in research and development with Chance Vought. The Mumford family is fine with no recent additions to report; Nick and Rosemary plan to attend our 15th reunion in June, 1960. Won't you join them?

Traveling northward you must stop to see the misplaced Mississippi gentleman, Julian Busby, now acting as an independent consulting oil geologist in Oklahoma. Lois, Buzz, and the boys are all fine; and the Busbys, too, are planning on the 15th. In case you are in doubt, Buzz describes his position as an individual "which consists of telling people where to drill for oil and then trying to retain a small interest in the deal" — an apt definition! Up in St. Louis you might find Armstrong Cork's G. B. Hetrick drinking on the veranda of his new home as his good wife Norma manicures their country estate.

As you travel eastward you would normally plan to stop in Cleveland to see J. J. and Eddie Strnad. Please call for reservations, as our oriental friends may not be home. Yes, as you have already suspected, J. J. and Eddie went to Japan

on an industrial tour last spring. We trust the week in Hawaii was not a business expense, J. J.!

Needless to say, you will plan to stop overnight in Pittsburgh to renew acquaintances with Jumper Gammon, Tom Stephenson, Al Oxenham, and Ed Stoltz. From Pittsburgh it is only about a six-hour ride to Pete and Lou Hickey's in Moorestown, N.J. From all reports they have a fine old home with plenty of room for visitors. As you might expect, the Hickey children are most attractive; Lisa is still the image of her mother, while Janet and the twin boys, Billy and Petie, have that Irish twinkle in their eye. While in Jersey don't plan to stop to see Art Schwartz, for he has moved to sunny southern California. Before going into New England you should plan a side trip to upstate New York to see Tod and Willie Howland'48 in Skaneateles, George and Betty Bickford in Syracuse, as well as Jerry and Lib Patterson in Binghamton. As I looked at the four kids on their Christmas card, I couldn't help but picture Lib hurrying Jerry with the picture, for it appears that Mark is about to drop month-old Elizabeth. Before crossing into Connecticut, stop off for a moment in White Plains; I feel certain Joan and Allan Porson 10-'44 would buy you a drink, as would Trudy and Max Ruehrmund. After the second Ruehrmund drink I feel certain Max would be working you over for a special gift contribution to the Alumni Fund.

Your first New England stop should be here in Stamford, where you would be royally entertained by Jim Levitan, now a New York attorney; Reg Stoops'48, an independent consultant in plastics; or myself. Possibly Gloria and Ralph Evans'48 would help you out of Darien. As you travel on through New England there are, of course, countless stops to make such as Chick and Helen-Marie Street's in Greenwich, R.I. of possibly Jil and Walt Kilsuk's(47) in Cranston, R.I. Once in Massachusetts you must stop in Framingham and see Betty and Class Agent Bill McKay. If you have not already forwarded your 1959 Alumni Fund contribution. Bill would undoubtedly remind you to forward that tax deductible item.

We understand, however, that you guys and gals are doing your duty, for which you should be justly congratulated; should you for some reason or other have forgotten to forward your Alumni contribution, why don't you write out your check today? Back to our travel log, plan to pay your respects to teaching classmates such as Dick Battin and Jay Forrester; you might want to make advance appointments, for possibly your contact might be away on a sabbatical leave such as Ned Bowman'47, teaching in Europe for six months. Your last stop should be Elaine and Bill Sherman's in Milford, N.H. — a restful retreat! — C. H. SPRINGER, *Secretary*, Firemen's Mutual Insurance Company, 420 Lexington Avenue, New York 17, N.Y.

1946

Last month's list of '46 men who are active on the M.I.T. Educational Council has been increased by at least one in the

recent appointment of Frank B. Wilder of Jacksonville, Fla. Frank is a consulting engineer with Frank B. Wilder and Associates of that city, is a member of the American Society for Heating and Air Conditioning Engineers, and is active in local Sertoma and Civitan civic groups.

A recent letter from the M.I.T. Club of New York asks class secretaries to publicize the club's doings. The club is permanently located at the Hotel Biltmore, has its own private bar, and serves lunch and dinner each weekday to members and guests. They also have a series of technical and social events, one or more each month, and the technical events usually include talks by key M.I.T. Faculty members. Although we are welcome on any day, one day a month is specifically scheduled for '46 regular luncheon meetings. These are as follows: March 26, April 30, May 28, June 25, July 30, August 27, October 1, and October 29. Additional information can be obtained from our class sponsor, Edward J. Fradkin, Scientific Design Co., Inc., 2 Park Avenue, New York, N.Y.

After M.I.T., R. E. (Gene) Bockhorst took a business degree at Washington University, St. Louis, and then joined Olin Mathieson Chemical Corp. in East Alton, Ill., as technical adviser for their Western Brass Mills. He spent two years as resident supervisor of shipbuilding in Chicago, and is now sales engineer for the Roll Bond Products Division of Olin Mathieson in Dayton, Ohio. He informs us that Roll Bond Products manufactures a unique heat transfer panel produced by pressure welding (by means of hot rolling) two sheets of metal together with "circuitry" provided by printing a "stop weld" substance prior to rolling. Gene is married, has two children, and lives at 4506 Longfellow Avenue, Dayton 4, Ohio. He'd be interested in hearing from any Course XIII fellows.

Charles Arthur Rigby operates his own civil engineering consulting business in Johannesburg, South Africa. After M.I.T. he spent one year in the Civil Engineering Department of the University of Natal, then eight years in charge of the Engineering Division of National Building Research Institute in Pretoria, and opened his consulting practice in 1955. Charles is a member of the South African Association of Consulting Engineers and of the South African branch of the Institution of Structural Engineers. He is a recent winner of that organization's Brand prize for the best paper presented. He lives at 26 Meyer Street, Oaklands, Johannesburg, South Africa.

Glen Dorflinger recently resigned as southwest regional manager of Fischer and Porter Co. to form his own company, Dorflinger Engineering Company, a concern in which he simultaneously holds two offices, president and janitor. As president he acts as a manufacturers' agent for industrial instruments, controls, and process equipment, covering the Texas and Louisiana Gulf Coast area. As janitor he helps his wife clean up after the four children, since his office and home are one and the same, at 220 Caruthers Lane, Houston 24, Texas. Glen is also active in the local Boy Scout organization. We are always willing, for a

small fee, to assist struggling young businessmen in their advertising programs, and Glen would like it announced that he is in quest of instrument and equipment manufacturers offering high priced, big volume, non-competitive items.

Henry F. Lloyd was promoted to captain, U.S. Navy, in 1957 and was director of training of Basic Training Command at Naval Air Station, Pensacola, Fla., where 2,500 naval aviators are trained yearly, until his address changed last summer to COMFAIRWINGSLANT, U.S. Naval Air Station, Norfolk, Va. Edward L. Belcher, after jobs with Ansco, Chase Brass and Copper, and Graflex, Inc., is now vice-president and production manager of the Caldwell Manufacturing Co. of Rochester, N.Y. His company makes window sash balances. Ed was married in 1953 and has one daughter. The Belchers live at 220 Brooklawn Drive, Rochester 18, N.Y.

Charles A. Thompson is a salesman for International Business Machines, working out of their Detroit office. He is married, has two children, and lives at 5740 Belmont Street, Dearborn 6, Mich. Angus N. MacDonald is a partner in the firm of Braxton and Co., 230 Park Avenue, New York, N.Y. Walter A. Sauter instructed at Cornell University until 1949 when he earned his master's in electrical engineering. He was recalled to the Navy and served two years aboard the U.S.S. *Benham* in the Atlantic and Mediterranean fleets. He joined Lear, Inc., of Santa Monica, Calif., in 1953. He is a section head in the Astronautics Division, Flight Control Systems Department. He was responsible for the design and development of the F-104 three-axis damper and automatic pitch control system. His major current assignment is the development of a two-axis stability augmentation system for the T-38. Walt is married, has two offspring, and lives at 19667 Valley View Drive, Topanga, Calif.

After earning his A.B. from the University of California in Los Angeles in 1947, George R. Grainger worked as a teaching and research fellow at the University of Notre Dame (whatever happened to Terry Brennan?) until 1954, earning his M.S. in 1949 and working on his Ph.D. which, upon completing his thesis, he expects to get this year. He is now a senior research engineer at Convair-Astronautics, helping to develop techniques for measuring and improving missile reliability. George is president of the Convair Toastmaster's Club, is married, has three children, and lives at 4943 Millwood Road, San Diego 17, Calif. Robert E. Ritterhoff is superintendent, mill shipping and raw material, for the Container Corporation of America in Philadelphia. The Ritterhoffs have three children and live at 610 Fernfield Circle, Stratford, Wayne P.O., Pa. Dave Black, Jr., is an associate in the Patent Development Division of Research Corporation, 405 Lexington Avenue, New York 17, N.Y. Dave is a lawyer and works on electrical patents for his concern, which is a foundation engaged in supporting research activities and in managing patents of educational institutions. In his letter Dave said that he intends to move to New Canaan, Conn., and he should be there

by now. He would be interested in hearing from anyone living in that area or in New York. — JOHN A. MAYNARD, Secretary, 15 Cabot Street, Winchester, Mass.

1947

Your Correspondent is certain that even if spring is not in the air where each of you are as you read this missive, one place that winter was not was in California. The weather is quite temperate, and most pleasant. All of which is to advise you that a momentous occurrence came into being just before Christmas; that's a long time ago, but with the lag between the deadline date and publication of *The Technology Review*, news always takes a little longer to be disseminated. Your class officers had a meeting! Claude Brenner was out here and telephoned me. We had dinner together and spent the evening partly discussing general plans for the 15th (count 'em) reunion in 1962. I was glad that Claude recognized me, because with his sporting a real honest-to-goodness soup-strainer moustache, he hardly resembled his old youthful self.

News of the undergraduate members of the Class is sparse, but what there is finds itself on the pleasant side of the ledger. Edwin S. Lawrence, Course II, has been appointed manufacturing manager of General Electric's foundry in Everett, Mass. He has been with G.E. since graduation, and has served as a metallurgist and a casting design engineer before being elevated to the managerial staff at G.E.'s Schenectady foundry. Congratulations are also in order for Robert K. McCandless, who received his S.B. in '47, and then stayed to obtain his master's in naval architecture; he has been appointed chief naval architect at General Dynamic Corporation's Electric Boat Division in Groton, Conn. Bob taught physics at the University of Connecticut before joining Electric Boat in 1951. Now we all know what the Class of '47 had to do with the *Nautilus*! Fred Ehrlich, who has been with General Electric's Aircraft Gas Turbine Division in Lynn, Mass., presented a lecture on "Jet Propulsion — From Conception to Date" to the Northeastern University student section of the American Society of Mechanical Engineers.

Graduate members of the Class who have made newsworthy achievements recently include Dr. Bernard D. Cullity, who is presently associate professor of metallurgy at Notre Dame and has received a \$44,800 grant from the National Science Foundation to support two research projects. James W. Carr, Jr., has been appointed head of the engineering and operating section at the Esso Research Laboratories in Baton Rouge, La. His new appointment includes responsibilities for designs, instrumentation, and operations of the pilot fluid catalytic cracking units at this installation. Jim is married to the former Katherine G. Nichols, and they have a two-year-old son. Dr. Arthur F. Helin is now staff specialist in the Plastics Research Department of the Spencer Chemical Company, in Kansas City, Mo. Dr. Melvin E. Salvesson, who received his S.M. in Course XV, is president of the Center of Advanced

Management in New Canaan, Conn., and has written a book entitled *Dynamic Organization Planning*. This book explains and elaborates on new techniques for more efficiency and less cost in large business organizations.

Below are listed new locations for some of the members of the Class: California: Del Rey Oaks, Wayne E. Meyer; El Segundo, Norman J. Andersen; Granada Hills, John R. Wittels; Livermore, William H. Rowen; San Francisco, Clifford W. Bundy. Connecticut: Cos Cob, James A. Finney, Jr.; West Hartford, Norman W. Saunders. Delaware: Wilmington, Joseph D. Weed. District of Columbia: Robert E. Sorensen. Illinois: Glen Ellyn, Edward J. Anderson. Indiana: Jeffersonville, Barrett B. Brown; Valparaiso, Clifton G. Frye. Kentucky: Murray, William G. Read. Maine: Bath, Abbot Fletcher. Massachusetts: Cambridge, Robert S. Jackson; South Lincoln, R. Langdon Wales; Topsfield, Harry E. Crossley, Jr., and Alfred J. Parziale. New Jersey: Bergenfield, Frank J. Anastasio; Bloomfield, Meyer S. Rosenthal; Dover, Robert L. Border; Englewood, Mitchell G. Lipinski; Livingston, Dr. Hyman W. Fisher; Westfield, Richard A. Potter. New York: Commander Malcolm Whitaker (A.P.O. 676); Garden City, Mrs. Jean Draffen Early; Jamaica, Peter P. Poulos; Tonawanda, Eugene C. Woestendiek; Syracuse, Arthur J. Zito. Ohio: Cleveland, Walter I. Strong; Wyoming, Dr. Gerhard Reethof. Oregon: Cornwallis, Robert J. Zaworski. Pennsylvania: Pittsburgh, John G. Holmes; State College, Professor Alan B. Draper. That's all for now. — **DON'T FORGET YOUR DONATION TO THE ALUMNI FUND.** — ARTHUR SCHWARTZ, *Secretary*, 8355 Blackburn Avenue, Los Angeles 48, Calif.

1948

With March comes the sad reality that winter sports will soon fade away. However, I hope none of us experienced any serious mishaps on the ski trails or skating rinks. I managed to get in a spill while skiing, but I'm happy to report I'm all in one piece!

Here's some good news for our winter sports enthusiasts. George Macomber, who is president and general manager of the Wildcat Mountain Gondola Tramway in Pinkham Notch, N.H., has joined with the owner of the Black Mountain Tramway to offer skiers the greatest concentrated variety of trails, slopes, and skiing conditions anywhere in the East, and to make it available on an economical basis. A seven-day pass, priced at \$30, will offer skiers a choice of 20 miles of trails and 100 acres of open slopes served by these two leading ski areas. I'm sure most of you remember George as an outstanding skier and athlete in school, and he might be a pretty good contact for next year's skiing parties.

Well, folks, you can cross off two more "eligibles" from your bachelor list! Leonard Allen Levenson and Clark L. Drasher, Jr., got married last November. Len married Susan Richmond, and they are now residing in Haverhill, Mass. Clark took as his bride the former Shirley Dadisman. Clark is associated with

the investment brokerage firm of Carl M. Loeb, Rhoades and Co., in New York City. Congratulations and best wishes to you both, Len and Clark!

Harold Conroy is proof that it takes a good M.I.T. man (particularly from the Class of '48) to do research work. Harold, who is assistant professor of chemistry at Yale University, has been selected to direct a three-year graduate program to study the chemical structure of alkaloids. This study is made possible by a grant of \$38,800 from the National Science Foundation. We wish you great success in this new endeavor, Harold.

In the line of appointments, we hear that John H. Hughes was recently promoted to the position of Assistant Director of the technical division in John Hancock's newly formed Electronic Computer and Data Processing Department. John has been with the John Hancock Mutual Life Insurance Co. since 1955, and was formerly senior programmer of the Data Processing Unit. Francis J. Rossi was among four to be appointed to top positions at the South Works, U.S. Steel Corp. in Chicago, Ill. Frank's new job was described as "a special assignment in the New Mills Engineering Staff." Congratulations and good luck, fellows; it's heartening to see that '48 is getting its share of well deserved success stories.

Also in the line of appointments, we are informed that William N. Hosley was among the four Rochester, N.Y., Alumni who were appointed to the M.I.T. Educational Council in the Rochester area. Bill is employed by the Eastman Kodak Company as senior statistician.

We only have one annual meeting on which to report this month. The 27th annual meeting of the Institute of the Aeronautical Sciences was held at the Hotel Astor in New York, January 26 through 29. Chairman for the session on Aeroelasticity was Holt Ashley.

Hear ye, hear ye! News from Alpha Tau Omega members. Dave Walton reports a new venture this year: he is owner of the Sancho Panza Espresso European Coffee House in Monterey, and he is also president of the Portofino Enterprises, Inc., of San Francisco, which has coffee houses in San Francisco and Berkeley. His Monterey establishment serves seven variations of coffee, or tea, hot chocolate, Italian sodas, and pastry. Anyone for a trip to Monterey?

Dean Ammer is now executive editor at Conover Mast in New York. Dean's duties include speeches and traveling. He has written a book entitled *Materials Management*, which he hopes to have published this year. Copies are available for \$7.00. Ken Bushway is presently working for B.F. Goodrich in Watertown, Mass., as technical superintendent for flooring and industrial products.

Bill Virtue, one of our few remaining bachelors (attention gals!), continues to work as sales engineer for low temperature gas separation plants for the American Messer Corporation. Bill and Bill Hosley were the only two A.T.O. members present at the 10th year reunion at the Curtiss Hotel in Lenox Mass., last summer. Bill Reinhardt has reported in from Waukesha, Wis. He is working with

the Wisconsin State Highway Commission as a right-of-way and roadside engineer. Bill now has two sons: Bill Jr., and Steve.

Additions to other A.T.O. members' families include: a baby girl, Barbara Lloyd, for Gardner Rogers; and a baby girl, Laura, for Roy Mellen. With Laura, Roy's children now number four. — RICHARD H. HARRIS, *Secretary*, 26 South Street, Grafton, Mass. *Assistant Secretaries*: HARRY G. JONES, 94 Oregon Avenue, Bronxville 8, N.Y.; HERBERT KINDLER, 128 Elatan Drive, Pittsburgh 16, Pa.; ROBERT R. MOTT, Box 113, Hebron, Maine.

1949

Are your reunion plans shaped up yet? A week end of prospectin', gamin', and pannin' at the Curtiss Hotel, Lenox, Mass. Remember the dates, June 12 through 14 of this year. Send for more information now and tell the reunion committee if it is probable you'll be there. Address: 10th Reunion Committee, M.I.T. Class of 1949, c/o Polaroid Corp., Cambridge 39, Mass. Enclose your class dues — \$3.00 — and a stamped self-addressed envelope. This will speed an answer back to you. Already planning to attend: Toohy, McQueen, Vitka, Jones, Eaton, Skolnikoff, Lynch, Campbell, Lewis, Clark, Berman, Hardin, Troy'48, Mary (Cretella) Lavine, Baker, Millard, Miller, Johnson, Hogan, Taschioglou, Cambourelis, Cox, Hilton, and Lambe. Many will have their wives with them. Act now. Write now. Pay now. Plan now. Be there for the best 10th reunion ever.

Our lead story (after reunion news above) concerns a unique device just recently unveiled by '49 classmate George Hatsopoulos and Joseph Kaye'34. Termed a "thermo-electron engine," it achieves the direct conversion of heat into electricity. Based on the phenomenon of thermionic emission, the new device has produced power with thermal efficiencies of about 12 per cent, may eventually reach 30 per cent. Heat sources can use conventional or nuclear fuels. Outstanding advantages are its light weight and freedom from maintenance (no moving mechanical parts).

Major Carroll E. Adams, Jr., has recently received an Army citation for exemplary performance of duty while a member of the Combat Engineer Service, Combined Arms Branch, Department of Military Art, U.S. Army Engineer School, March 1, 1956, to June 1, 1958. His citation was for the development of an outstanding new phase of instruction named nuclear weapons employment. Major Adams received a prior citation while in command of troops in Austria and also recently received his paratroopers wings at Fort Benning, Ga.

Among the Tech men participating in the summer general meeting and air transportation conference of the American Institute of Electrical Engineers at Buffalo was John Alger who, with Jim Duane'53, Edward Magnusson'48, and R. T. Smith delivered a paper on "Computer Analysis of A-C Aircraft Generators." Raymond Baddour (with E. R. Gilli-

land'33) has been awarded a two-year grant of \$19,000 by the National Science Foundation for research on the "Flow of Gases Through Microporous Solids." Bill Bohlman is now president of the M.I.T. Club of Milwaukee.

Van Boughton has been appointed manager of the Process Development Department of Dewey and Almy Chemical Division, W. R. Grace and Co. Dave Breed received his master in business administration degree from Harvard last June. Pete Cambourellis is now working as technical assistant to the director of Product Development, Solvay Process Division, Allied Chemical Corp. in New York. Charles Carver has accepted an appointment as associate professor of civil engineering at the University of Massachusetts in Amherst. For the past two years he was employed at the Woods Hole Oceanographic Institution.

Chi Chang was awarded his Ph.D. degree at the University of Minnesota last June. Jim Cowdery has been appointed a vice-president at Processes Research, Inc., Cincinnati and New York. Jim joined the company in 1952. William Cowles and Carl Bausch'38 have formed a partnership, Cowles and Bausch, architects, in Shelburne, Vt. Cornelius Day and Mary Swanson were married last June in Stamford, Conn. He is working as an operations analyst for the American Brass Co. in Waterbury. John Donner has been named as a project manager by Sylvania Electric Systems division of Sylvania Electric. He'll be in charge of Sylvania's electronic defense subsystem contract for the B-52 bomber. The contract was awarded to Sylvania by Sperry Gyroscope, which is the weapons system manager for the B-52's electronic countermeasures system.

At the May '58 meeting of the Acoustical Society of America papers presented included the following: William W. Lang, Physics Department, Iowa State, "Sound Propagation in Flexible Porous Media"; Edward M. Kerwin, Jr., Bolt, Beranek, and Newman, Inc., "Vibration Damping by a Stiffened Damping Layer"; Ira Dyer, Bolt, Beranek, and Newman, Inc., "Sound Sources in a Jet Stream," and with Peter Franken'56, "Noise Radiated by Jet Systems." Dave Dudley has taken a new position as chemical engineer at the Pine Ridge Experiment Station of Atlantic Research Corp. in Alexandria, Va. Among M.I.T. men working at General Aniline and Film Corp. are William Duggins, Commercial Development Department, New York, and Kenneth Prytherch, General Dyestuff Co., also in New York.

Earl Eames was invited to Jamaica last June by the Council for International Progress in Management to conduct a series of conferences and seminars on production management with members of the Industrial Development Corporation of the island. Earl is the president of General Management Associates, Inc., Boston management consultants. Dave Esson is now located in Norfolk, England, where he is continuing his work with the Campbell Soup Co. Participants in the October meeting of the Optical Society of America in Detroit included Nisson Finkelstein, who presented a progress report on fiber optics.

Jack Fogarty writes that he and his wife Peggy are now living in Philadelphia with their new son Eric, who was born last May. Jack is working as a project engineer for Remington-Rand Univac, currently doing redesign work on the Univac calculating tabulator. Harold Humes has recently had published by Random House his first novel, *The Underground City*. Al Livingston has been awarded the designation of Chartered Life Underwriter by the American College of Life Underwriters. His office is located in Miami, Fla. Lawrence Livingston has been nominated by the Alumni Association for the position of Alumni member on the M.I.T. Corporation Visiting Committee for the Department of Regional and City Planning.

Tom McNulty's architectural firm, McNulty-Fawcett Associates, is responsible for the design of the candlesticks, ciborium, and chalice now used in Catholic services at the M.I.T. chapel. Melvin Micevic recently returned to the states after a two-month safari in the Belgian Congo studying diet habits of the natives. Mike is a sales representative for a chemical company in New Bedford, Mass.

Through our Class Agent Archie Harris we learn that Howard Millard is continuing as a senior partner and treasurer of the Pilling Engineering Co. in Dedham, Mass., doing street and sewerage construction supervision and design and lately work for the Army Engineers and Metropolitan District Commission on flood control. Howard also reports he is working for himself in building design, reports, investigations, and so forth, in Westwood, Mass., where he lives with his wife and family. He is also the building inspector in Westwood. Howard also wrote that John Horton is now vice-president of the Newark Brush Company. Herbert Neitlich has become associated with Metropolitan Life Insurance Co., Blue Hills, Mass., district.

Robert Newman, Associate Professor of Architecture at M.I.T., will lecture at the Royal Academy of Fine Arts, Copenhagen, Denmark, during the school year '58-'59 under a Fulbright scholarship. He was also a participant last April at the University of Illinois Annual Architects Short Course, where he spoke on "Effect of New Architectural Forms on the Acoustics of Buildings."

Martin O'Brien and Dorrine Duval were married last June in Hillsboro, N.H. Martin is a research engineer at Grede foundries in Milwaukee. Lindsey R. Perry has been named product manager, Special Purpose Tubes and Hi-Fi Components at CBS-Hytron, manufacturing division of Columbia Broadcasting System. He was formerly manager of production planning and control. Richard K. Richards was one of several Tech men participating in the Eastern Joint Computer Conference held in Philadelphia in December. He spoke on "New Systems Design Techniques."

Dick Singleton will be interested to know, if he doesn't already, that his cousin Bob Bartsch from Mason City, Iowa, is a member of the class of 1962 at Tech. Nathan Sokal in a nice note writes of the arrival of their third, Diane, in October. Nathan goes on to say:

"Family and one-half acre of lawn in Lexington (Mass.) keep me well occupied in my spare time." Harvey Tuck was the cocontributor of an article, "The Application of a Digital Computer to the Design of Air Conditioning System Components," which appeared in a recent issue of the *General Motors Engineering Journal*. Harvey is a senior engineer in the Research and Future Products Department of G.M.'s Frigidaire Division.

Commander Thomas Whitlow is now in Washington, D.C., where he will spend a three- to four-year tour of duty with the Bureau of Aeronautics (Avionics Division). Lester Whitmore with L. A. Boggs presented a paper on "Utilization of Spent Sulfite Liquor Carbohydrates" at a meeting of the American Chemical Society in San Francisco last April. Arthur Willis has been appointed general manager of the A. O. Reynolds Co. in Indianapolis. The company manufactures horticultural specialty items, plastics, and automatic planting equipment.

While you can't see the color of blood on this page, we will take a vow to have a note here about you before this June's reunion if you provide the information. To quote Peter Lorre, "All we need is the information." Best wishes for a prosperous year. — O. SUMMERS HAGERMAN, Jr., Secretary, 8519 Pringle Drive, Cincinnati 31, Ohio.

1953

Al Lazarus came back from the dead, bringing us up to date on his life and the activities of a few others. Al received his Ph.D. in Physics from Stanford University last October, and has since taken a job with the Rand Corp. in Santa Monica. He also reports that a number of people have migrated to California: "Ricardo Gomez got his Ph.D. at M.I.T. and is working at the California Technology synchrotron. Arnold Levine of Tech Show fame is teaching, going to school, and reading Shakespeare at local coffee houses. Mort and Janet Grosser are in Palo Alto, where Mort is working for his degree in history. Dave Bernstein is at Stanford Research Institute after getting his degree at Stanford."

Al also asked what I'm doing. Briefly, I'm teaching graduate courses in transportation engineering here at M.I.T., and spending the balance of my time doing research, consulting work, and edging up (slowly) on a doctorate. John Harding is also out on the West Coast, having just received his Ph.D. from California Institute of Technology, and a professorship from the University of California (Division of Physical Sciences) shortly afterward. Al and Jackie Danzberger are still there, too; Al dropped by recently and reports that he is working on the Titan missile project as resident engineer for Arthur D. Little.

Dick Linde is sponsor for the Class of 1953 luncheons being held at the Biltmore Hotel in New York City on the Tuesday following the first Monday of each month. Next time any of you are in the big city, drop him a line or call him (c/o American Cyanamid Co., 30 Rockefeller Place, N.Y.C.). A review of classmates active in Alumni Association work

might be helpful. Mandy Manderson is serving as the class representative on the Alumni Council, and Joseph Marshall is secretary for the M.I.T. Club of Southern California (located in Los Angeles). Four classmates are counselors for the Educational Council of the Institute. James Gardner is serving in this capacity in Stockton, Calif.; Donald Miller in Cincinnati, Ohio; Robert Wallace in Toledo, Ohio; and Clarence Hanford in Portland, Ore. As you well know, this group is helping immeasurably in interviewing, screening, and counseling prospective candidates for admission to M.I.T. I'm sure we all are grateful for their help.

My bachelorhood is now history. All went well (I didn't faint, thank goodness!), and we had a great time at the reception. Several classmates were there to whoop it up with us: Mandy and Anne Manderson, Jon and Virginia Van Winkle, Bill and Ann Gilbert, Bob and Betty Reid (they are expecting in a few months), and Jim and Dory Howard. Paul and Ginny Shepherd hoped to come, but Paul has been sidelined lately with some-kind-of-pneumonia. Enjoyed a letter from Gil and Janie Gardner which said in part: "Gil is suffering from severe shock as a result of your little joke. The announcement came from Cleveland — are you sure you know about it? . . . We have had a marvelous time down here — made some very nice friends and partied to our hearts' content. Gil has done very well in school and the city is beautiful, especially the stores\$. I've done more shopping\$\$. Gil has recovered from his broken hand, and they are back at Mount Clemens, Mich.

Paul Moody and Carol Robinson Kolm are coauthors of a paper entitled "Syringe-Type Single-Crystal Furnace for Materials Containing a Volatile Constituent," which appeared in the December issue of the *Review of Scientific Instruments*. Early in December Albert Lee spoke on China to the International Club of Pittsfield. He has served continuously with General Electric since graduation and is an electrical engineer in the design engineering section of the G.E. distribution transformer department. In 1956 Albert received the G.E. managerial award, and he has been active in the Chinese Christian Youth Conference of the east and has served as chairman, treasurer, and program committee chairman.

On December 6 Herbert Oestreich and Judith Rubner were married in White Plains, N.Y. Herbert received his M.D. from Cornell University Medical College following graduation from Tech; Judith graduated from Sarah Lawrence College.

Many of you have kept me up to date on the activities of your lives, information for which I am most grateful. However, I would appreciate an occasional word or two from the rest of you classmates; what is "commonplace" to you will be refreshing news to the rest of us. Even a post card will help. — MARTIN WOHL, *Secretary*, 100 Memorial Drive, Apartment 8-18C, Cambridge 42, Mass.

1954

With winter now beginning to fade into the past, our reunion is looming in the

rather immediate future. By now you should have received the letter sent out by the reunion committee last month, with all of its pertinent data, and the summary of the results of our class questionnaire of last year. For the nonce, I can do no better than to remind you of the reunion and urge that you start now to make plans to attend. A business or vacation trip to Boston in mid-June would be an ideal arrangement. But now is the time to make plans.

A letter from Dave Dennen informs us that he is on leave of absence from Eli Lilly and Company, "enjoying an Army tour." Dave is with the 82d Airborne Division at Fort Bragg, North Carolina. He says that daughter Laurie is walking and talking; and, by the time you read this, he and wife Jane should have another addition to the Dennen tribe. Dave also mentions that Bill Marshall is stationed at Fort Bragg, with the Medical Corps. Howard Brody's wife, Lois, sends greetings to the Class from Howard and herself. The Brodys are living in Pasadena, Calif., where Howard is acquiring a Ph.D. in Physics from California Institute of Technology this month. Next month Howard, Lois, and daughters Lisa and Victoria are escaping to Paris to undertake post-doctoral research under the auspices of the National Science Foundation.

The many Christmas cards received from the members of the Class were most appreciated, and have also brought in some worthy news items. George Schwenk is threatening us with a new edition of the "Jolly Boys Address List," a publication which usually contains more than the title indicates. Until it arrives, however, we will have to be satisfied with anticipation. For the time being, George tells us merely that he is now operating on a 30-hour day, pursuing a Ph.D. in Mathematics at the University of Michigan. Dick Hayes confirms our earlier report that he is back at Tech, studying astronautics for the Air Force. He has gotten himself engaged, too. The lucky gal is Ellen Donaghue, who graduated from Regis College in '56 and lives in Milton, Mass. The wedding will be June 6, and Dick says they will be back in Boston for the reunion.

Ron McKay, who has just about taken over as our Number 1 source of news since Dean Jacoby started hiding out in Canada, attached a lengthy letter to his Christmas card. Ron says: "Sally and I had a blessed event last October 17 — Kenneth Bruce McKay — a fine broth of a lad." The McKays are now living in Arlington, Mass., and Ron is doing architectural acoustics for Bolt, Beranek, and Newman, Incorporated, Cambridge, Massachusetts.

For the other news, we quote Ron: "Have you heard about Dean's intent to marry Judy Haywood next summer? This is the end! Warren Davis went on a six weeks' 'round-the-world trip in his government job (actually, he does top secret bootlegging) about a year ago. Dave and Patti Vogel are back in the states after Dave's long Army tour in Europe. Paul Spreiregen took a month-long European vacation before leaving the Corps of Engineers in October. He is now working on

the new Government Center Building Project in Boston. Bill Gleckman is still working and studying in Zurich but has given up the romantic idea of becoming a rare doctor of architecture. Bill Ferrini and Sylvan Limon are working for architects in Boston. Marty Cohen, Mort Davis, Gus Rohrs, and Mel Smith are all architecting it up in New York City. Ray Shearer and his wife Peggy were in the Boston area last year. Ray received his degree in Course II and they have departed for parts unknown." If Ron thinks that Dean's getting married is "the end", I shudder to think of his reaction to the news that Marcia Duffy and I are planning a similar maneuver on May 30.

Jim Klapmeier has gotten himself written up in the *New York Times*. Jim is in the drive-your-own-houseboat business in International Falls, Minn. He rents his houseboats, with or without guides and maps, to fishermen, hunters, and family vacationers for use on Rainy Lake, Minn. He flies around in a leased plane to keep track of his lessees, and at latest report had been operating six months with no bad snags. Apparently the world is still amenable to men of vision and imagination. — EDWIN G. EIGEL, JR., *Secretary*, 3654 Flora Place, St. Louis 10, Mo.

1955

Santa Claus failed to bring the enormous bundle of mail that we asked for, but here's what there is. Many thanks to all who sent holiday greetings. Tom Doherty '56 writes that he finally clinched that degree in architecture last June and is now working for Hamilton and Goody in Cambridge and living in Boston. Ellen Dirba, another architect, seems to be enjoying Aspen, Colo., terrifically. Chan Stevens, back in Mansfield, Ohio, since he left the Army last spring, writes that Bob and Edie Greene have a new daughter, Brenda. Congratulations to them; also to Dick and Judy Bergman, who greeted a daughter, Deborah Jill, last November.

Norry Hersey, the Wanderer (that's the way he signs his name these days), sent Christmas greetings from Garmisch, Bavaria. Norry says that he did run out of money, as Chan had predicted, after the 'round-the-world jaunt; but instead of being lost in Asia, he quite fortunately ran into a good job with the European Exchange System as an engineer. He's now enjoying very much the European travel which is part of his job as well as the great skiing and music in the Garmisch-Munich area. According to Norry, Phil Gruber and Fran Selvitelli are both still in Germany with the Army. News of one wedding, that of Frank Leitz to Virginia Ann Beuthel in Boston on the last day of January, has arrived.

The M.I.T. Club of New York has asked us to call attention to the numerous activities now taking place in its elegant new quarters in the Hotel Biltmore, which are available to Alumni in the metropolitan area. Also interesting to those who get to New York less frequently are the monthly class luncheons of the club. The '55 luncheons fall on the Tuesday of the first full week of each month, counting Monday as the beginning

of the week. If the system is too complicated for you, surely Bob Temple, who is our class sponsor for these luncheons, will be glad to straighten you out on the dates and greet you at the luncheon! Bob is with the American Car and Foundry Division of A.C.F. Industries in New York City, 750 Third Avenue.

Note another address below, the new one of the better half of this note-writing team. By the time that you read this the "Lieutenant" may be obsolete, but I'm not sure of the prospective date of return to "civilianization." Please! let's have some news! — MRS. J. H. VENARDE, *Secretary*, 107 Mullin Road, Wilmington 3, Del. FIRST LIEUTENANT L. DENNIS SHAPIRO, 15 Linnaean Street, Cambridge 38, Mass.

1956

This issue is farewell for a while, so out we go with lots of news. Next month M. Philip will grasp the reins.

The third of January the wife and I left Scott Air Force Base, Ill., and after a short stay in Springfield we drove to Wright-Patterson Air Force Base, where on the fifth, we talked to George Luhrmann and Mickey Reiss. Learned that Joed Davis, Gene Marcus, Paul Polishuk, and Richard Quinn are all taking extension courses from Ohio State in addition to their duties at the base. By the way, most of their duties are on the secret list, but we did find out that George works on Strategic Air Command and Mickey is a project engineer on space vehicle guidance systems.

On the fifth (the car wouldn't start in —7 degree weather) we drove to Akron to talk to Joe Huber and Carl Thomas. Carl is in production work at Goodyear. Also found out that Larry Jacowitz has received his master's from Ohio State and Tony Turrisi is working at Okonite Cable in New Jersey. Here in Boston Jack Merkl, between his studies at Harvard, informs that Joe Goodwill is with U.S. Steel in Pittsburgh and Pete Korn is doing metallurgical work with Wilbur B. Driver in New Jersey. Pete and wife wish to announce the arrival of a son, Johnny, on July 4, 1958; and Pete is building a new home.

In a recent letter from Ray Peck he informs that he was released from the Army last September and entered the University of California Graduate School of Civil Engineering. He lives in Berkeley with three other students.

In a recent letter from the M.I.T. Club of New York City they announce the initiation of a monthly class luncheon at their quarters in the Biltmore Hotel. The '56 day is the Wednesday of the first full week of each month. Contact Thomas Slater at Slater Electro Manufacturing Company, Glen Cove, Long Island, N.Y., business phone OR 6-1100, home phone PO 7-0786.

In the 1958–59 Alumni Directory, classmates listed in addition to the officers are Chuck Dietrich, Class representative on the Alumni Council; Eduardo del Hierro, Bogota club representative on the Council; and Lloyd Brace, associate of the Council.

From Phil Bryden we hear that Dick and Nancy Benjamin proclaim the birth of a daughter on May 30, 1958. At Christ-

mas I received a card from Don and Martha Brideweser, who are living in the Boston area. Peter Alexander, in a recent card, reveals that he is working on a Ph.D. in Physics at Purdue and is married. William Alston in a card tells that he is in the third year of graduate physics at Yale and is working on an electron accelerator.

Thomas Lambie and Robert Malster both received their master's from Tech. Charlie Joyce received training at Ft. Monmouth, N.J., and then finished out his six-month tour as Reserve Officers Training Corps. instructor at New York University. Thomas C. Nelson is now at Ft. Monmouth.

Donald Block is with Ramo Wooldridge in California. Gaylord Schwartz was formerly at Carter Oil and is now with Jersey Products Research Co. in Tulsa. Carl Slenk is at the Linde Division of Union Carbide in Buffalo. Dick Teper spent two years with Martin on the Vanguard project. While at Cape Canaveral he was a block house panel operator. Now he is with Rocketdyne on the Nomad project. Phil Trussell is with Jackson and Moreland Construction Corp. in Cambridge.

Don't forget if you go to Mexico this year try to make the M.I.T. Club of Mexico festival in the early part of this month. It is also time to start making plans for Alumni Day this June. —BRUCE B. BREDEHOFT, *Secretary*, 1528 Dial Court, Springfield, Ill. M. PHILIP BRYDEN, *Assistant Secretary*, 3684 McTavish Street, Montreal 2, P.Q., Canada.

1956G

The M.I.T. Club of New York is now permanently located in the Hotel Biltmore in New York City. It serves an excellent luncheon and dinner each weekday to members and their guests. Those Alumni who have occasion to visit New York, as well as indigenous New Yorkers, can find an interesting, delightful atmosphere at the club. It is an excellent place for a midtown New York rendezvous or a professional or business luncheon.

Currently doing research for M.I.T. is George Davidson in the Instrumentation Laboratory. A word from Lieutenant Randolph Zelov has him stationed in Newport News, Va. U.S. Navy Lieutenant Commander and former classmate, Carl Ostertag, Jr., was transferred to Oak Harbor, Wash., then left for Honolulu in December. Carl is a graduate in naval architecture. Alan Wolfe, S.M. in Biochemistry, has taken up residence and employment in Washington, D.C. His address is 1749 Howard Street, Northwest.

Two M.I.T. graduate student marriages have taken place. Miss Carol Anne McCurdy became the bride of John Regenaar. Carol is a graduate of the Newton College of the Sacred Heart. John holds a bachelor of science degree from the U.S. Naval Academy as well as his M.I.T. degree. Miss Joan Delores McIntyre has exchanged marriage vows with Joe Distel. Joan is from Boston. Joe hails from Philadelphia, where he attended Villanova. —LIEUTENANT (J.G.) CHARLES T. FREEDMAN, *Secretary*, Special Weapons Division, U.S.S. *Independence*, CVA-62 F.P.O., New York, N.Y.

1957

We recently attended the monthly Alumni dinner at the Faculty Club, along with Ed Roberts and Paul Nicholson. Ed is currently preparing his paper, "Simulation Techniques for Understanding Research and Development Management," which he will deliver before the Institute of Radio Engineers National Convention on March 23 at the Waldorf-Astoria Hotel in New York. Both he and Willard Fey are working on industrial dynamics problems in the same office in the Sloan Building. Ed, by the way, is to be married to Miss Nancy Rosenthal in June after the award of his master's degree.

Paul told us that he is now working for Raytheon Missile Laboratory in Bedford on Operations Research, in addition to nocturnal studying for his master's at Boston University. Our asking in what phase of O.R. brought the clarification that he was concerned with scientific decision making. This left us wondering whether he was actually in control of the defense of the country, but we ceased questioning him until we have an opportunity to brush up on Course XV semantics. What we did learn was that there has been a Mrs. Nicholson since last June. She is the former Miss Virginia Fremer. They were both at a pre-Christmas party with Ron and Pat Keefe and Lee and Marilyn Niemela. Ron is working at Epsco and studying law at Boston University Evening School. Lee has embarked on the road to his Ph.D. in Physics here at M.I.T.

Paul brought news of several other classmates whom he had seen, and we shall now pass this along. Terry Porter is at Berkeley, where he is pursuing studies for his doctorate. Sid Zafran is also in California, engaged in experimental work at the Co-operative University wind tunnel in Los Angeles. Leon Knapp is employed at Raytheon. Larry Berger was married recently to Jo Ann Newby in Dallas, Texas. The couple now are living in El Paso, where Larry has been working on guided missiles for the Army. With difficulty, we have at last tracked down Bill Schoendorf. After having spent a summer with Arma in Garden City, Long Island, and having received his master's degree at the University of Pennsylvania, he is now teaching electrical engineering at Purdue and studying for his doctorate. Jerry Yutan, who was married last summer to Miss Lois Englander of Swampscott, is now working in New York City.

A recent marriage was that of Paul Nathan and Carolyn Cohen, a graduate of Boston University. After a wedding trip to Miami Beach, the couple returned to Boston, where Paul is employed at Melpar. Charles Speer was commissioned a Navy ensign on December 4, after completion of preflight training. He now moves on to more advanced work at the Saufley Field Naval Auxiliary Air Station at Pensacola. Don McIver has been named an instructor in the guided missile training course at Lowry Air Force Base in Colorado.

Larry Schwartz is working at Instrumentation Laboratory in the initial stages of doctoral study. There is a possibility, however, that he may be obliged to serve as an officer in the Air Force, with a con-

sequent postponement of his studies. He attended a quiet New Year's party with Pierre Cathou and Lester Gimpelson at the home of Renata Egone in Brookline. Incidentally, another member of the old Atkinson (East Campus) Jolly Boy group, Marshall Schachtman, was almost run down by your writer in Market Street. Marshall was up from Bell Laboratories in New Jersey to enjoy a Saturday meal at Durgin Park, where we still see a creditable representation of '57 classmates.

In January, we met Henri Slesinger, who was in Boston for a visit. He is working for Pfizer Chemical Co. in New York and Groton, Conn., for the present, but will have a more permanent assignment in Sao Paulo, Brazil. His home is in Rio de Janeiro.

Not too long ago, we were taken by Ben Chertok to a small Greek restaurant in Boston, where we filled our stomach with good food for a rather nominal fee. Ben claims that Boston has perhaps the best cosmopolitan assortment of dining rooms in the world, when price, quality, and diversity are considered. His capacity for judgment in this field was gleaned from a tour of many European and Mediterranean countries after a stay at the University of Göttingen made possible by a grant, not from Duncan Hines, but from the German government's Marshall Plan "Thank You" Board. His tale of this international adventure, which included an extended stay in a castle as the guest of a young count, seems almost to come from the imagination of Alexandre Dumas. Ben found time also to study for and audit 17 courses in the humanities and sciences at Göttingen. He has now returned to Tech, where he is studying for his master's in nuclear engineering.

Speaking of Greek restaurants reminds us of the time four years ago when we were first invited to one by Mark Adams. Mark is in the Air Force and stopped here in Boston last summer on his way for a visit to his home in Manchester, N.H. He has recently written that he is now assigned to an electronic reconnaissance squadron as electronic warfare officer flying RB-66 aircraft at Shaw Air Force Base in South Carolina. We are uncertain as to what the RB means—probably not Russian Bomber at any rate.

Again, let us request you to send us data on yourselves and any of our classmates you have seen recently; we should also appreciate your keeping us informed as to your address. — ALAN M. MAY, *Secretary*, 55 East End Avenue, New York 28, N.Y. MARTIN R. FORSBERG, *Assistant Secretary*, 383 Harvard Street, Cambridge 38, Mass.

1958

As we continue right along with our initial survey of the Class of '58, there is still a long list of weddings to take care of. Sifting the stack at random (the Course XVIII grads will appreciate that), I notice that among the higher-degree awardees John Wood, Jr. (Ph.D. in Geology and B.S. from Virginia Polytechnic Institute), was married to Mathilde Heuser of Gleschendorf, Germany, and Hanover, N.H., way back in early June. They're living in Washington, D.C., where John is attend-

ing Officers' Training School through the courtesy of dear old Uncle Sam. A high school classmate of mine, Hugh Murphy, III, was married to a Bradford Junior College graduate, Nancy Andrews, in my home town of West Hartford, Conn., on June 7. Hugh, who served in a summer training program with the U.S. Marines, was commissioned a second lieutenant upon graduation and was stationed at the Corps base in Quantico, Va., at last word. John Evans, who has attended an impressive string of academic institutions, added the degree of "Mrs." to Helen Bonier of Watertown, Mass., and Lasell Junior College on June 14. Along the way to his S.M. in Industrial Management degree in '58, John acquired a B.S. from Rensselaer Polytechnic Institute and studied at Harvard's Graduate School of Business Administration. Following their honeymoon trip to Bermuda, the couple settled in Philadelphia.

John McCarty, II, was wed on the same day to Sandra Taeger of Branford, Conn. Sandy majored in physical therapy at Sargent College of Boston University and will complete her schooling in Los Angeles, where the couple is now living, at the University of Southern California. Stew Pinsof, III, married still another Connecticut girl, Evelyn Shear of Waterbury, on June 15. Evelyn was graduated from Lasell and Boston University, where she received a bachelor's degree in education. They're currently residing in Northbrook, Ill., whence Stew is commuting to work at the Sipi Metal Company in Chicago. Finally, a fellow Course II grad, Terry Sheehan, married Sonja Ann Johnson (a namesake but no relation to Yours Truly) from Terry's home town of Brockton, Mass., on June 21. The couple honeymooned in New Hampshire and Canada and then moved into their residence in Bridgeport, Conn., where Terry is employed by the Singer Sewing Machine Company.

Continuing on in the military and civilian employment department, Steve Hadjiyannis, VI, completed his six weeks' summer training hitch with the Army Reserve Officers Training Corps at the Signal Corps base at Fort Gordon, Georgia, and was commissioned a second lieutenant in August. Ira Schwartz, also VI, joined the Terrier-Tartar Radar Engineering Department of Sperry Gyroscope Company in June. Another two Course VI men, Thomas Turner, Jr., and Donald Zalkin, made their professional "debut" with the Electrical Design Engineering and Project Star staffs of the Airborne Instruments Laboratory Division of Cutler-Hammer, Inc., in New York. Procter and Gamble's Public Relations Department has announced that Randolph Wilkinson, S.M. in XV, and John Kipp, XV, have joined Products Research Departments of that firm. Randy is employed by the Paper Division, and John is with the Foods Division. If one can trust my word-of-mouth grapevine, hockey and baseball player Ed Sullivan, III, is rumored to be working for the Bethlehem Steel Corporation in Pennsylvania. I'm more sure about Merle Persky, another fellow Course II man, since I've encountered him quite a few times around Boston this fall. Merle is with Block Asso-

ciates, a small engineering firm with offices in Cambridge. He's sharing an apartment with Mig Segal, X, who's back at Tech for S.M. work in the Chemical Engineering Graduate School.

As I wander through the halls of the Institute between classes, I'm constantly running into '58 grads who have returned for graduate work toward advanced degrees. Just to mention a few of these fellows, Dave McDougall and Chuck (Charley Brown) Henricksen are among the Course I S.M. candidates, along with Ed Esquenazi. There is a veritable host of my Course II classmates who have returned to "give the Institute another whirl," among them John Del Bene, Sandy Israel, Pete Lawes, Dick Rosenthal, and Gene Ziegler. Also from Course II there's Cal Morse, who seems to be specializing in the new Course XXII (Nuclear Engineering) courses, and the popular Siamese soccer star, Sivavong (Eddie) Changkasiri, who'll be studying at Tech for two more years in order to add an S.M. in XV degree. Then from Course III, there's Richie Johnson; and from VI there are of course quite a number, among them Sandy Weinreb and Paul Zeiger, who's also a research assistant. In VIII I've come across Dave Baldwin and Chuck Ingraham so far.

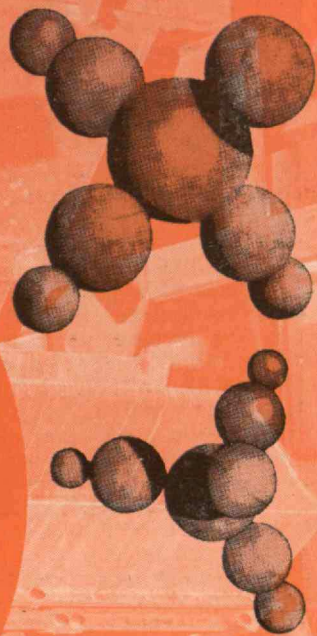
These, of course, are just a few of the many fellows who have stayed on at M.I.T.; and we'll be mentioning others in subsequent columns. Naturally many have enrolled at other schools, too. Art Fiori, X, is continuing in that field under a fine fellowship at Princeton; Bob Thomson, XV, and Bob Featherstone, VI, are sharing an apartment while taking graduate work in Business Administration at the University of Michigan. They're both quite satisfied with life in Ann Arbor so far, by the way. Two-year basketball captain Mac Jordan, I, and Paul Skala, II, are among the several Tech grads who are broadening their educational base with graduate study in the two-year program toward an M.B.A. degree at "HarBus" (Harvard Graduate School of Business Administration).

A note which recently arrived showed that '58 grads are already winning recognition. The outstanding qualities of scholarship and leadership of Class Vice-president Huber Warner, X, were rewarded by his being selected for one of 25 Province Awards for 1958 by his social fraternity, Sigma Chi. Our Tau Beta Pi "Veep," who also captained the very successful M.I.T. varsity lacrosse team last spring, won the award for the New England-Nova Scotia area. I'm sure that this won't be the last noteworthy achievement we'll be relating in this column about this promising engineer and great all-around guy. Congratulations on a well deserved award, Hub!

Well, I'll cut things short for this issue right here and continue in this same corner next month. To quote a couple of well-known radio and television personalities, "Write if you get work. . . ." and don't forget to notify me or the Alumni Office when you settle down into a somewhat permanent address, so that we can keep in touch with you as time goes by. — HERB JOHNSON, *Secretary*, 484 Beacon Street, Boston 15, Mass.

$$T_{(\text{°F. min})} = 380 - 4C(\% P_2O_5)$$

sets lowest
temperature
to digest
Phosphate
Rock for
directly
producing
Acid with
high $\%P_2O_5$



Phosphoric
Acid by

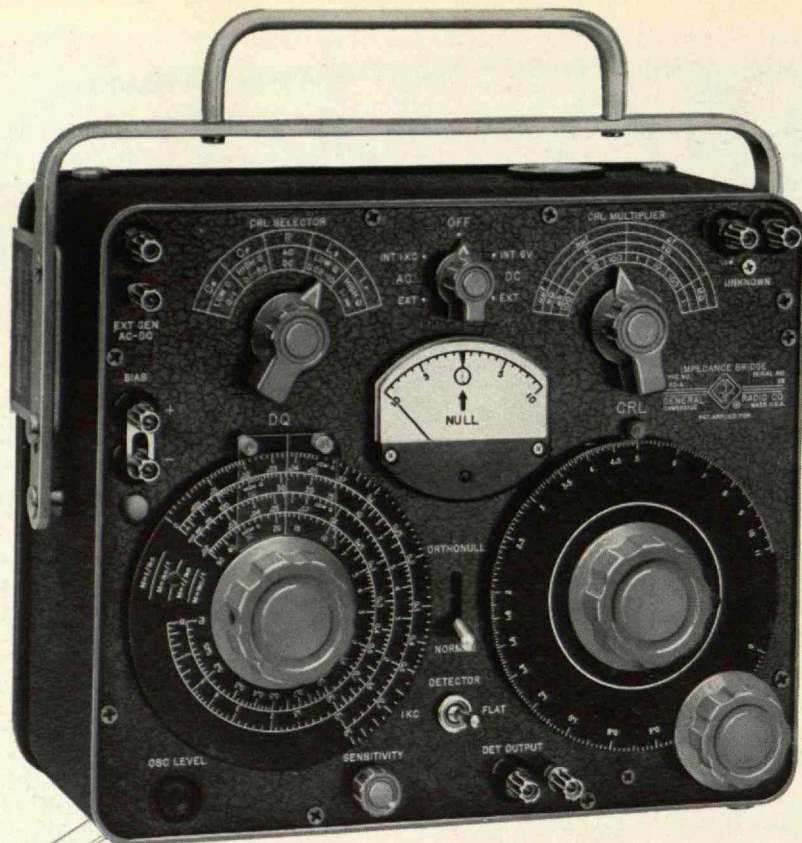
The **NORDENGREN** **ANHYDRITE PROCESS**

- Higher Temperature—Higher Reaction Rate—Small Unit
- High Filter Rate—Small Filter ◦ Low Scaling Rate
- 43–45% P_2O_5 (59–62% H_3PO_4) Acid without Concentrator
- Low Calcium Sulfate and Low Fluorine Content ◦

CHEMICAL
PROCESS
DESIGN

THE **UHDE CORPORATION**

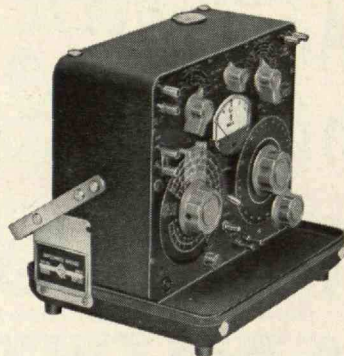
350 FIFTH AVENUE, NEW YORK 1, N.Y.
8204 Empire State Building



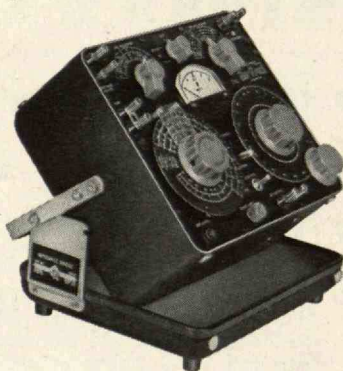
**RUGGED
PORTABLE PACKAGE**



**... provides protection in
transit and convenience in use**



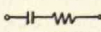
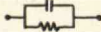
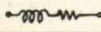
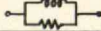
... panel tilts to any convenient angle



Announcing... A NEW IMPEDANCE BRIDGE

A Completely New Design to Replace A Famous G-R "Workhorse"

- ★ Bridge is battery operated and completely self contained — has built-in transistorized 1-kc oscillator and selective detector; meter null indication for both ac and dc. Total battery drain is less than 10 ma, providing 1-yr. life for typical laboratory use.
- ★ Orthonull*—a new, unique mechanical ganging of bridge's variable elements permits measurements to be made *without annoying sliding balances*.
- ★ Wide range — to 1000 μ f, 1000 h, and 10 M Ω .
- ★ Accuracy holds over all ranges — not reduced at range extremes.
- ★ Provision for applying up to 600v dc to capacitors and small currents to inductors for polarization purposes and measurements at various d-c levels.

| PARAMETER | RANGE | ACCURACY |
|--|---|---|
| Resistance, AC and DC (External DC required above 100 k Ω) | 0.001 Ω to 10 M Ω 8 ranges | $\pm 1\% \pm 0.001 \Omega$ (residual $R \leq 1 \text{ m} \Omega$) |
| Capacitance, series or parallel | 1 μ f to 1000 μ f 7 ranges | $\pm 1\% \pm 1 \mu$ f (residual $C \leq 0.5 \mu$ f) |
| Inductance, series or parallel | 1 μ h to 1000 h 7 ranges | $\pm 1\% \pm 1 \mu$ h (residual $L \leq 0.2 \mu$ h) |
| D (for series capacitance case)  | 0.001 to 1 at 1 kc | $\pm 5\% \pm 0.001$ at 1 kc |
| D (for parallel capacitance case)  | 0.1 to 50 at 1 kc | $\pm 5\%$ |
| Q (for series inductance case)  | 0.02 to 10 at 1 kc | $\pm 5\%$ |
| Q (for parallel inductance case)  | 1 to 1000 at 1 kc | For 1/Q $\pm 5\% \pm 0.001$ at 1 kc |

FREQUENCY RANGE: (1-kc supplied internally)
1% accuracy for L and C from 20c to 20 kc
1% accuracy for R from 20c to 5 kc
D and Q ranges are direct reading at 1kc

Type 1650-A Impedance Bridge . . . \$440.

Type 1650-P1 Test Jig, for convenient production testing . . . \$19.00.



SEE IT AT THE IRE SHOW
along with 15 other important new instruments

Booth Numbers 3302-3312

*U.S. Patent 2,872,639

GENERAL RADIO COMPANY

The Best Instruments In Electronics

CAMBRIDGE
MASSACHUSETTS

NEW YORK AREA
6605 W. North Ave.
Ridgefield, N. J.
N. Y. WORTH 4-2722
N. L. WHITNEY 3-3140

CHICAGO
6605 W. North Ave.
Oak Park Ill.
Village 8-9400

PHILADELPHIA
1150 York Rd.
Abington, Pa.
HAncock 4-7419

WASHINGTON, D.C.
8055 Thirteenth St.
Silver Spring, Md.
JUliner 5-1088

SAN FRANCISCO
1182 Los Altos Ave.
Los Altos, Cal.
WHirecliff 8-8233

LOS ANGELES
1000 N. Seward St.
Los Angeles 38, Cal.
HOLlywood 9-6201

IN CANADA
99 Floral Pkwy.
Toronto 15, Ontario
CHerry 6-2171